Study and Analysis of the Status of IUU fishing in the SADC Region and an Estimate of the Economic, Social and Biological Impacts

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stop illegal fishing

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Study and analysis of the status of IUU fishing in the SADC region and an estimate of the economic, social and biological impacts

The programme of support to tackling IUU Fishing in Southern Africa

Illegal, unreported and unregulated (IUU) fishing is a global issue with many harmful environmental, economic and social impacts. The need for strengthened fisheries governance at national and regional levels has been increasingly recognised by the international community as one of the main requirements if IUU fishing is to be halted. In response to this, and as a follow on action from the International High Seas Task Force, the UK Government has committed to support an African policy process to tackle IUU fishing. As the first step in this process Dr Abraham Iyambo, Minister of Fisheries and Marine Resources in Namibia, has lead the way on behalf of the coastal States of the Southern African Development Community (SADC) by gaining support from the UK to reduce IUU fishing in the region. The programme has been designed around five components to support the policy process of implementing the SADC Protocol on Fisheries in relation to tackling illegal fishing and leading into a Ministerial Conference and Declaration anticipated to take place in mid-2008 in Namibia.

This report was produced for the SADC Member States as an information document. The accuracy of the information cannot be guaranteed in all cases, as some sources could not be independently verified.

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Table of contents:

I. List of tables

II. List of figures

III. List of abbreviations used in the text

Abbreviation	Full name
BCLME	Benguela Current Large Marine Ecosystem
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CPUE	Catch Per Unit Effort
DRC	Democratic Republic of the Congo
DG MARE	Directorate-General for Maritime Affairs and Fisheries
DWFN	Distant Water Fishing Nation
EEZ	Exclusive Economic Zone
EIO	Eastern Indian Ocean
EU	European Union
ENVISAT	Environmental Satellite
FAO	Food and Agricultural Organisation of the United Nations
GLM	Generalized Linear Model
ICCAT	International Commission for the Conservation of Atlantic Tuna
ICM	Integrated Coastal Management
IOC	Indian Ocean Commission
IOC-MCS	Regional MCS Project implemented by Indian Ocean Commission
IOTC	Indian Ocean Tuna Commission
IPOA	International Plan of Action
IUCN	International Union for Conservation of Nature
IUU	Illegal, Unregulated and Unreported
IRD	Institut de Recherche pour le Développement (France)
MCS	Monitoring, Control and Surveillance
MCM	Marine and Coastal Management (South Africa)
MFMR	Ministry of Fisheries and Marine Resources (Namibia)
MPA	Marine Protected Area
MSY	Maximum Sustainable Yield
NAFO	North Atlantic Fisheries Organisation
NEAFC	North East Atlantic Fisheries Commission
NCG	The National Coastguard
NORAD	Norwegian Agency for Development Co-operation
RFB	Regional Fisheries Body
RFMO	Regional Fisheries Management Organisation
SADC	Southern African Development Community
SEAFO	South East Atlantic Fisheries Organisation
SIOFA	Southern Indian Ocean Fisheries Agreement
TAC	Total Allowable Catch
TAE	Total Allowable Effort
TPDF	Tanzania People's Defence Force
VMS	Vessel Monitoring System
WCPFC	Western and Central Pacific Fisheries Commission
WIO	Western Indian Ocean

0 Executive summary

The study explores and helps to quantify the magnitude and types of IUU fishing in the SADC region as well as the economic, socio-economic, nutritional and biological impacts at both the national and regional level. The report has been compiled in support of the process that the SADC Member States have undertaken to prepare a SADC Marine Fisheries Ministerial Declaration to Stop Illegal Fishing 2008.

Synthesis of the characteristics and scale of IUU fishing

It is extremely difficult for national authorities to obtain reliable figures on the magnitude and types of illegal fishing, precisely because it is an illicit activity and perpetrators seek to evade detection. The scarcity of data on infractions and the difficulty in gaining access to them is one of the fundamental shortcomings that frustrate many attempts at assessing and analysing the levels and complexities of IUU fishing. Data on the number of offences in the SADC region were generally found to be extremely limited, either because countries had no means of managing the data, making them not readily obtainable or because they do not have sufficient capacity and means to determine what is happening more than a few miles offshore. Statistics obtained on the number of offences are therefore not necessarily representative of the scale of the IUU problem.

Nevertheless, through a range of information gathering activities and a degree of triangulation between different sources, it is possible to begin to build up a picture of how much IUU fishing has been occurring. During this study we undertook the following main activities to estimate the levels, typology and impacts of IUU in the various fisheries of the SADC region:

- Desktop research; literature search (e.g. FAO, OECD, MRAG, Traffic, WWF, HSTF, search of local press etc.);
- Initial remote contact with key players, including EU Delegations in-country, ex-SADC MCS project staff, IOC, FAO / InfoFish Africa contacts;
- Remote structured interviews / questionnaire with fishery administrations and representatives from the fishing industry (including general situation, MCS resources and capacity and specific incidences of IUU);
- Contact with local researchers (e.g. to ascertain the extent to which estimates of removals due to IUU fishing are included in stock assessments);
- Country visits to key locations for highest priority cases.

Offshore fisheries:

In the offshore pelagic sector, the Indian Ocean purse seine fleet, which does not tranship at sea, appears to be operating legitimately, albeit with a small degree of underreporting or misreporting. However, although the level of IUU by large deep-freeze longliners is regarded as being in decline, large numbers of small fresh fish longliners, which up to now have not been fulfilling management requirements, have moved into the region and they do tranship at sea. During 2007, there were in excess of 600 port visits in Indian Ocean SADC ports by this fleet sector. Port calls by those flagged in non-contracting IOTC member states has also been observed. A major concern is that many of these vessels do not meet the standards set by the IOTC. Many of them are not registered with the IOTC and do not carry logbooks or report catches in an adequate manner to their flag state. Vessel markings are often inadequate and on occasions do not exist at all. Vessels have also been known to change their name during port visits making it extremely difficult for them to be monitored. In addition to the impacts on tuna stocks, there is also concern over unregulated shark catches from this sector. In the Atlantic Ocean, only isolated incidents involving foreign flagged longliners have occurred in recent years in both Namibia and South Africa.

In the offshore demersal sector, there have been increasing reports of a number of known IUU vessels, which previously targeted Patagonian toothfish in the Southern Ocean, now having converted to bottom set gillnets, targeting sharks in the Mozambique Channel and south of Madagascar.

Coastal industrial and semi-industrial fisheries:

In the coastal industrial and semi-industrial fisheries, despite VMS monitoring, zone violations are by far the most commonly detected offence in the east African shrimp fishery alongside closed season violations and gear infringements. Illegal transhipping of catches, from industrial to semi-industrial vessels is also thought to occur alongside dumping, discarding and high-grading, however illegal fishing itself does not appear to be very common compared to other offences. Compliance issues in the coastal industrial fisheries in Namibia and South Africa relate mostly to the misreporting of landings by legal operators and exceeding bycatch allowances. However reports from industrial demersal fisheries further north off Angola and DRC indicate that clashes occur between Chinese industrial vessels and local artisanal fishermen, targeting reef fishes. Authorities in Namibia report that offences in the mid-water trawl sector are relatively high when compared to the large pelagic and demersal fisheries. Fishing without a valid licence is probably the most serious offence in this sector. In the sedentary fisheries IUU fishing of abalone in South Africa has been reported on and has been well documented. This has recently led to the suspension of the commercial fishery to protect stocks.

Artisanal fisheries*:*

In all the East African SADC states, many of the large variety of artisanal fishing practices, have apparently been transformed into small-scale industrial fisheries. Accompanying this transformation has been an increase in the number of detected offences, especially in fisheries centred on urban areas. Catches in general are poorly reported and unregulated and minor offences, if detected, are not recorded, maintained or collated into a usable format. The most common illegal practices in these small-scale fisheries appear to be fishing in closed seasons or closed areas and using illegal gear. Destructive fishing practices such as dynamite and cyanide fishing also appear to be a problem. IUU fishing of sedentary species is also likely to be widespread in the artisanal fisheries. Although in most cases the motivation for some of these offences in the small-scale and artisanal sectors is subsistence, profit seeking, as is the case in the industrial sectors, can also be a factor.

Factors influencing IUU

Understanding the key factors that influence the prevalence of IUU fishing is a particularly difficult issue to define for the SADC region. Governance issues have been clearly identified as key to making progress in combating IUU. In this study, we have identified the degree of political will and commitment to the implementation and support of regional initiatives targeting IUU, both governance related issues, as of critical concern.

SADC states have been strengthening their MCS capacity over the last 5 years to prevent, deter and eliminate IUU fishing albeit to varying degrees. Initially this was done through the operational, strategic and institutional capacity building programmes of the EU funded SADC MCS Programme. On the whole, capacity still remains weak in many cases, but IUU fishing does not appear to necessarily thrive in those countries with the lowest MCS capacity. Another factor also driving IUU fishing is the value of potential catches. If a high value stock, such as tuna, is found in a particular area the IUU pressure tends to be higher than in areas with low value catches, where there may not be any pressure to fish illegally at all.

The main MCS capacity issues that appeared to have direct influences on IUU in the SADC region include:

- Limited knowledge of the scale of IUU activities in the region;
- Limited regional assets and capacity (with the exception of South Africa and Namibia);
- Extensive size of areas requiring surveillance and significant dispersal of fleets;
- Limited, and in many cases non-existent, regionally-coordinated MCS systems (or even bilaterally in targeted areas facilitating joint deployment or 'pooling' of resources);
- Absence of any directed body to regionally oversee MCS activities and information exchange, except in the cases of those RFMOs whose remit covers certain fisheries e.g. IOTC, CCAMLR.
- Poor governance in many of the countries

Being a member or not of an RFMO does not appear to be a contributing factor to the scale or nature of IUU that a particular country experiences. The effectiveness of SADC MCS systems in ensuring compliance with the laws and RFMO obligations will depend very heavily on whether or not domestic laws provide appropriate mechanisms to facilitate this task, and for this they need support and a structured plan assisting them to meet these challenges. From a regional perspective, there are inadequate formal or diplomatic mechanisms or frameworks in place between SADC states to allow for exchanges of data. For this reason effective collaboration in MCS operations has up to now been restricted. Work carried out by the IOC MCS Project has resulted in new laws in Madagascar and Mauritius as well as a series of new regulations. This has however taken over two years to achieve. It is hoped that legal reviews supported by IOTC will soon be extended to cover Tanzania as well. Mozambique has recently reviewed its maritime fisheries legislation and is currently reviewing legislation for inland fisheries. Many of the new regulations in this country aims to tackle IUU issues.

Most illegal fishing recorded in the SADC region has been carried out by non-coastal state vessels. The controlling interests for these vessels are generally based in China, Korea, Spain, Russia and Indonesia; although in most cases the vessels have been flagged in China, Taiwan, Korea and Indonesia or fly other flags of convenience such as Equatorial Guinea, Cambodia, North Korea and Tonga[1]. In the industrial and semi-industrial fisheries, zone violations by these vessels occur frequently, however the true scale of their activity is poorly understood. Vessels involved in transgressions often have joint venture partners in the coastal state, but in many cases these partners do not have much control over what goes on at sea. The vessels are often licensed, but due to the lack of thorough at-sea and port inspections, compliance with regulations is invariably poor. In some cases fishing licenses are issued to vessels without them ever entering the ports, or being inspected by officials of the coastal state. Conversely vessels that are not issued licences are still permitted to be 'based' at the coastal state port where their movements within that state's EEZ are not monitored effectively (e.g. by VMS).

There is a degree of unreported fishing that occurs in domestic fisheries, and also in offshore longline fisheries. This is true for Mauritius, Madagascar, Mozambique, Tanzania and Angola. Many Indonesian and Taiwanese flagged vessels do not routinely use logbooks and when they do, they do not record nor report all the species they catch in any format useable for management purposes. In South Africa and Namibia, unreported fishing offences are often committed by their own nationals and / or on vessels flying their own flags. This is probably due to the effective MCS capacity in both these countries and their insistence that most vessels fishing in their waters have to fly their flags, ensuring better flag state control over their activities.

Transgressions in the artisanal sector is an issue in all the SADC countries, although it is limited in Namibia and South Africa, which do not have large participation in this sector. Many of these fisheries are not regulated by the coastal states and issues such as underreporting or misreporting, and illegal activities such as fishing of prohibited species or exceeding catch limitations on bycatch species, high grading of catches at sea (dumping) etc. are common.

[1] The Fair Practices Committee of the International Transport Workers' Federation has produced a list of 32 countries declared as Flags of Convenience (FOC's); www.itfglobal.org.

Although a country's geographical location, due to the fisheries occurring in their waters, is often one of the most important factors contributing to the level of IUU fishing experienced, improving their MCS capacity and political will is something definite they can do to minimise or eliminate IUU.

Impacts of IUU fishing

The 'indirect losses' are considered to be relatively low in the offshore large pelagic sector. With the exception of South Africa, Namibia and Angola, none of the SADC countries have fishing fleets directly active in these fisheries. A report produced by the IOC-MCS Project showed that revenue derived from licences (including EC FPAs) only amounted to 3% of all revenue generated in the tuna fishing sector. Revenue generated by port activities and processing brought by far the most economic gain. The number of port calls and the nature of the services those vessels receive had a more 'direct impact' on the economy than whether or not those vessels are licensed and paying a fair licence fee.

Ecosystem impacts in the offshore large pelagic sector are regarded as low to medium across the SADC region as the catch proportion taken by IUU fishing is comparatively low. However the situation may change if the problems of misreporting are not controlled, especially if the tuna stocks become overfished. There are however more immediate concerns over the underreporting of the catches of shark. Given the limited direct participation by SADC coastal and island states in marine fisheries, either by having their own fleets or reliance on tuna as a main protein source, social impacts were also thought to be fairly low across the region.

IUU fishing on both the coastal shrimp and demersal reef fisheries are considered to cause the most serious impacts. With respect to economics the impacts are mainly indirect. This is because, even though there is illegal fishing going on, it is generally perpetrated by coastal state nationals. The catch is therefore still landed and processed in the coastal state. Some local benefit is therefore still derived from the fishing activity, even though it is IUU fishing. Ecosystem impacts resulting from IUU fishing are, however, significant. Both the target resources and bycatch / discarded species are substantially impacted (shrimp fisheries have one of the highest ratios of bycatch to landed catch). These problems are exacerbated because little of the bycatch is landed in the coastal state by the industrial fishing fleet. Some of the catch is discarded and some of it is transhipped to semi-industrial and artisanal vessels and landed locally, but will not be attributed to the IUU vessels. Bycatch is generally not quantified and often captains get paid directly for fish. Social impacts are also high within this fishery as there are direct conflicts between the industrial and artisanal (beach seine and other) fisheries when fishing in the inshore areas. These include impacts on food security of coastal communities and loss of fishing gear through entanglements, constraining their ability to fish.

In demersal and small pelagic fisheries indirect economic losses through misreporting or underreporting by fishers are considered to be the main issue. Ecosystem impacts are also an issue due to the level of bycatch. Social impacts in these fisheries are relatively low as there is little direct competition for resources between IUU fishers and local communities. Elaborate schemes by IUU operators to increase their catches or their catch value (through high grading) can cause losses of revenue to the coastal states through lost licensing revenue, and if prolonged can have serious ecological impacts. The impacts of IUU fishing on sedentary species is mostly a concern in South Africa, which suffers large-scale poaching of abalone linked to organised crime. The closure of the fishery in 2008 was an emergency measure as an attempt to save dwindling stocks and is having direct social and economic impacts on the legal fishers. With IUU fishing being linked to crime syndicates and the drug trade, the social impacts of closure were also related to the safety of enforcement personnel. The economic losses to South Africa are huge as catches are often smuggled out of the country and exported from neighbouring states to avoid detection by customs authorities, resulting in direct losses of export tax.

The main action points for discussion at the Expert Consultation included:

- Creating the diplomatic environment and increase the capacity of the states to exchange information on IUU fishing
- Harmonising and improving the legal frameworks to provide effective sanctions and deter IUU fishing in the SADC region
- Implementing training in port inspection and regional collaboration on standards
- Establishing either a new Regional Vessel Record or associating with the Indian Ocean Commission IOC-MCS Programme for this purpose, and encouraging interaction with other existing vessel records e.g. ICCAT / IOTC
- Experiment with new technology to improve the regional cost effectiveness of sea going patrols
- Implement IUU assessments to improve the estimates of IUU by sector in the region

1 Introduction

Illegal, Unreported and Unregulated (IUU) fishing is a pressing global issue with significant environmental, economic and social impacts. Developing countries often bear the greatest impacts, making it a high priority issue in the SADC region.

IUU fishing is defined within the Food and Agriculture Organisation of the United Nations (FAO) International Plan of Action to Prevent (IPOA-IUU) to deter and eliminate Illegal, Unreported and Unregulated Fishing, as the following:

Illegal fishing refers to activities:

- conducted by national or foreign vessels in waters under the jurisdiction of a state, without the permission of that state or in contravention of its laws and regulations:
- conducted by vessels flying the flag of states that are parties to a regional fisheries management organisation but operate in contravention of the conservation ad management measures adopted by that organisation and by which the states are bound or relevant provisions of applicable international law, or:
- in violation of national laws or international obligations, including those undertaken by co-operating states to a relevant fisheries management organisation.

Unreported fishing refers to fishing activities:

- which have not been reported, or have been misreported, to the relevant national authority, in contravention of national laws and regulations:
- undertaken in the area of competence of a relevant regional fisheries management organisation, which have not been reported or have been misreported, in contravention of the reporting procedures of that organisation.

Unregulated fishing refers to fishing activities:

- in the area of application of a relevant national or regional fisheries management organisation that are conducted by vessels without nationality, or by those flying the flag of a state not party to that organisation, or by a fishing entity, in a manner that is not consistent with or contravenes the conservation and management measures of that organisation, or:
  in areas or for fish stocks in relation to which there are no applicable conservation or management measures and where such fishing activities are conducted in a manner

Source: FAO. 2001. IPOA - International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing. 24 pp

This study was commissioned by the Southern African Development Community (SADC) through the Stop Illegal Fishing Programme and aims to advance the understanding of IUU fishing in the Southern African coastal states of Angola, DRC, Madagascar, Mauritius, Mozambique, Namibia, South Africa and Tanzania. The study aims to explore and help to quantify the magnitude and types of IUU fishing in the region as well as the economic, socio-economic, and environmental impacts at both the national and regional level. The report has been compiled in support of the process that the SADC Member States have undertaken to prepare a SADC Marine Fisheries Ministerial Declaration to Stop Illegal Fishing 2008. The outputs and main findings were first presented at the SADC Expert Consultation in April 2008.

2 Approach and Methodology

IUU fishing is an ever-evolving complex combination of activities that undermine the good management of fisheries. In the SADC region IUU activities range from underreporting or misreporting of catches by otherwise legitimate operators, to theft of resources and sophisticated schemes to process and launder illegally caught fish so that it enters into national and international markets alongside legal products. If this activity goes undetected and unpunished, huge profits can be made that attract local and foreign operators, including organised crime, often leading to conflicts between unlicensed foreign vessels and local artisanal fishermen.

It is extremely difficult for national authorities to obtain reliable figures on the magnitude and types of illegal fishing, precisely because it is an illicit activity and perpetrators seek to evade detection. The scarcity of data on infractions and the difficulty in gaining access to them is one of the fundamental shortcomings that frustrate many attempts at assessing and analysing the levels and complexities of IUU fishing. Data on the number of offences in the SADC region were generally found to be extremely limited, either because countries had no means of managing the data, making them not readily obtainable or because they do not have sufficient capacity and means to determine what is happening more than a few miles offshore. Statistics obtained on the number of offences are therefore not necessarily representative of the scale of the IUU problem.

Data on the number of offences in the SADC was on the whole found to be extremely limited, either because the countries have no means of managing the data, making it not readily obtainable or because they do not have sufficient capacity and means to determine what is happening beyond their maritime zones. Statistics obtained on the number of offences would therefore not necessarily be representative of the IUU problem, if indeed one exists. Furthermore, the detection of offences, particularly in the artisanal sector, was often seen to be somewhat random and again not reflective of the level of occurrence of different types of offences.

Nevertheless, through a range of information gathering activities and a degree of triangulation between different sources, it is possible to begin to build up a picture of how much IUU fishing has been occurring. During this study we undertook the following main activities to estimate the levels, typology and impacts of IUU in the various fisheries of the SADC region:

- Desktop research; literature search (e.g. FAO, OECD, MRAG, Traffic, WWF, HSTF, search of local press etc.);
- Initial remote contact with key players, including EU Delegations in-country, ex-SADC MCS project staff, IOC, FAO / InfoFish Africa contact;
- Remote structured interviews / questionnaire with fishery administrations (including general situation, MCS resources and capacity and specific incidences of IUU);
- Contact with local researchers (e.g. to ascertain the extent to which estimates of removals due to IUU fishing are included in stock assessments);
- Country visits to key locations for highest priority cases.

With respect to each country, the following information was sought:

1) Details on different fisheries;
2) Infringements / levels of IUU fishing per sector;
3) MCS resources & capacity;
4) Governance index and policy;
5) Involvement in RFMO / RFB's;
6) Types / nationalities of IUU fishing fleets; and,
7) Economic, social, and environmental impacts

Questionnaires used in the study to target both management and industry representatives, as well as the data collection checklists used on country missions, are appended in Annexes 1 and 2.

Much of the insight and opinions contained in the text is not based on verifiable data sources, but has been provided by individuals that have spent a considerable time in the region and who are very familiar with the fisheries and IUU fishing activity. Where necessary, we have reported anecdotal information based on personal knowledge, however, for many reasons, such as personal safety and professional ethics, co-workers often declined to be directly referenced.

3 Synthesis of the characteristics and scale of IUU fishing

3.1 Offshore fisheries

3.1.1 Large pelagic (highly migratory)

3.1.1.1 South Western Indian Ocean

The EEZs of all the SADC Indian Ocean coastal and island states overlap to a greater or lesser extent with the area of the Western Indian Ocean (WIO) tuna fishery. Around one million tonnes (t) of oceanic tunas[2], with a processed value of €2 - 3 billion are caught each year in the WIO. Landings in the WIO are close to triple those of the Eastern Indian Ocean (EIO), reflecting the high levels of productivity associated with nutrient rich upwellings along the Arabian and Somali coastlines. Fisheries for large pelagic tuna and tuna-like species[3] in the Indian Ocean are unique for two main reasons; firstly catches taken by the artisanal sector are similar in volume to those of the industrial sector; and secondly catches taken by the industrial sector are fairly evenly split between longline and purse seine fleets.

The majority of the active purse seine fleet is Spanish and French, fishing under negotiated access rights linked to European Community agreements in force with all Indian Ocean SADC coastal / island states, with the exception of South Africa, as well as private and bilateral agreements and in high seas areas. Other purse seine fleets active in the WIO are flagged in the Seychelles, Thailand and Iran. The re-flagging of the Russian purse seine fleet in 2006 brought with it the end of IUU purse seine vessels in the Indian Ocean. The purse seine fleet size on the whole has remained fairly stable with only moderate increases in 1997, although in the last few years significant advances in technology used on the vessels has greatly increased their capacity to find, catch and transport fish.

Fishing activity in the WIO is widely distributed, although it tends to follow an annual pattern of distribution summarised below:

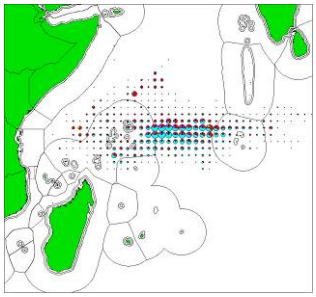
- 1st Quarter Central WIO, Seychelles plateau and Northern Mozambique Channel
- 2nd Quarter Southern Somali basin and Mozambique Channel
- 3rd Quarter Somali basin and Western Seychelles plateau
- 4th Quarter Central WIO and Seychelles plateau

This can be clearly be seen in Figure 1 which shows the monthly movement of the Indian Ocean purse seine fleets.

In contrast to purse seine activity, longline fishing is comparatively more dispersed ranging over the entire tropical and subtropical WIO (Figure 2).

The purse seine fleet, which does not tranship at sea, appears on the whole to be operating legitimately, albeit for a degree of underreporting or misreporting (<10%, IOTC Pers. Comm.). However, although large deep-freezer IUU longlining is regarded as being in decline in the WIO, (as shown by Indian Ocean Tuna Commission (IOTC) data in Figure 3), large numbers of small fresh fish longliners[4] (under 30 metre class) that do tranship at sea, have moved into the region.

[2] The oceanic tunas include skipjack *(Katsuwonis pelamis),* yellowfin *(Thunnus albacares)* and bigeye *(T. obesus),* which are caught by purse seine fisheries, and albacore *(T. alalunga)* and southern bluefin *(T. maccoyii)* which, together with yellowfin and bigeye tuna, are caught by longliners.
[3] Tuna-like species include principally billfish, with swordfish *(Xiphias gladius)* having the highest catches.
[4] Many vessels also now have a freezing capacity for bycatch species or non-sashimi grade tuna



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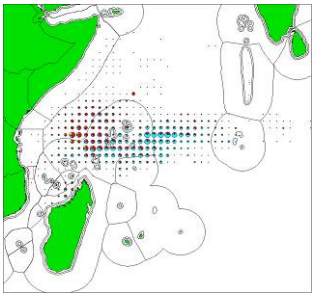

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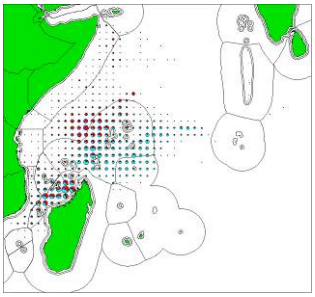

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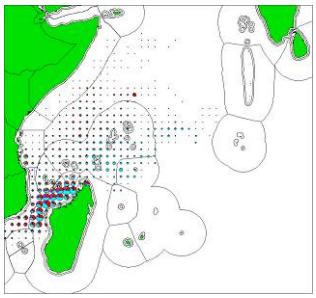

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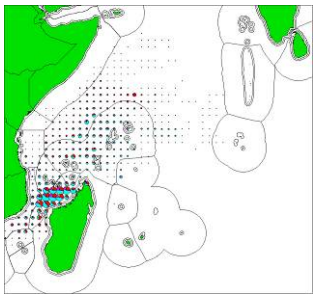

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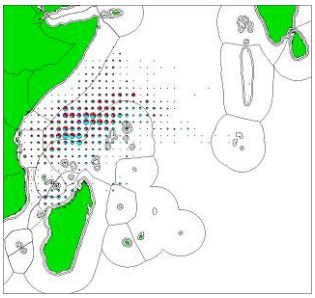

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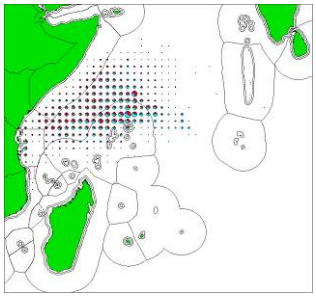

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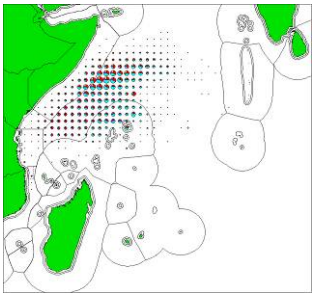

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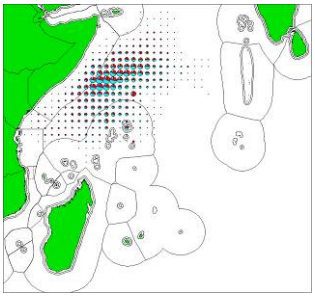

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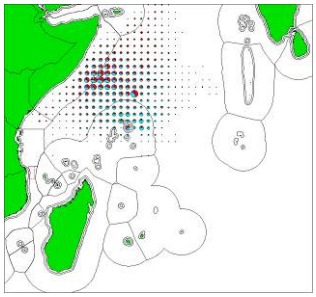
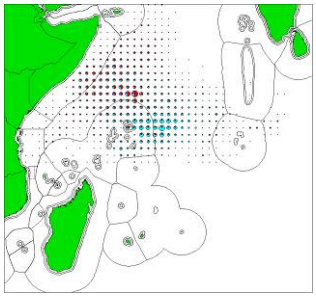


(j) October



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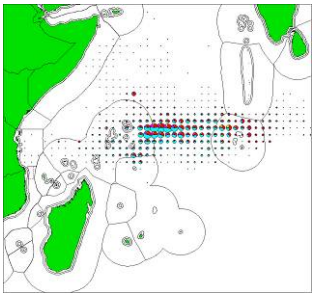


(l) December

Figure 1 **Indian Ocean purse seine effort distribution (hours) by flag state by month (a) – (l), (based on total effort 1996-2005).**

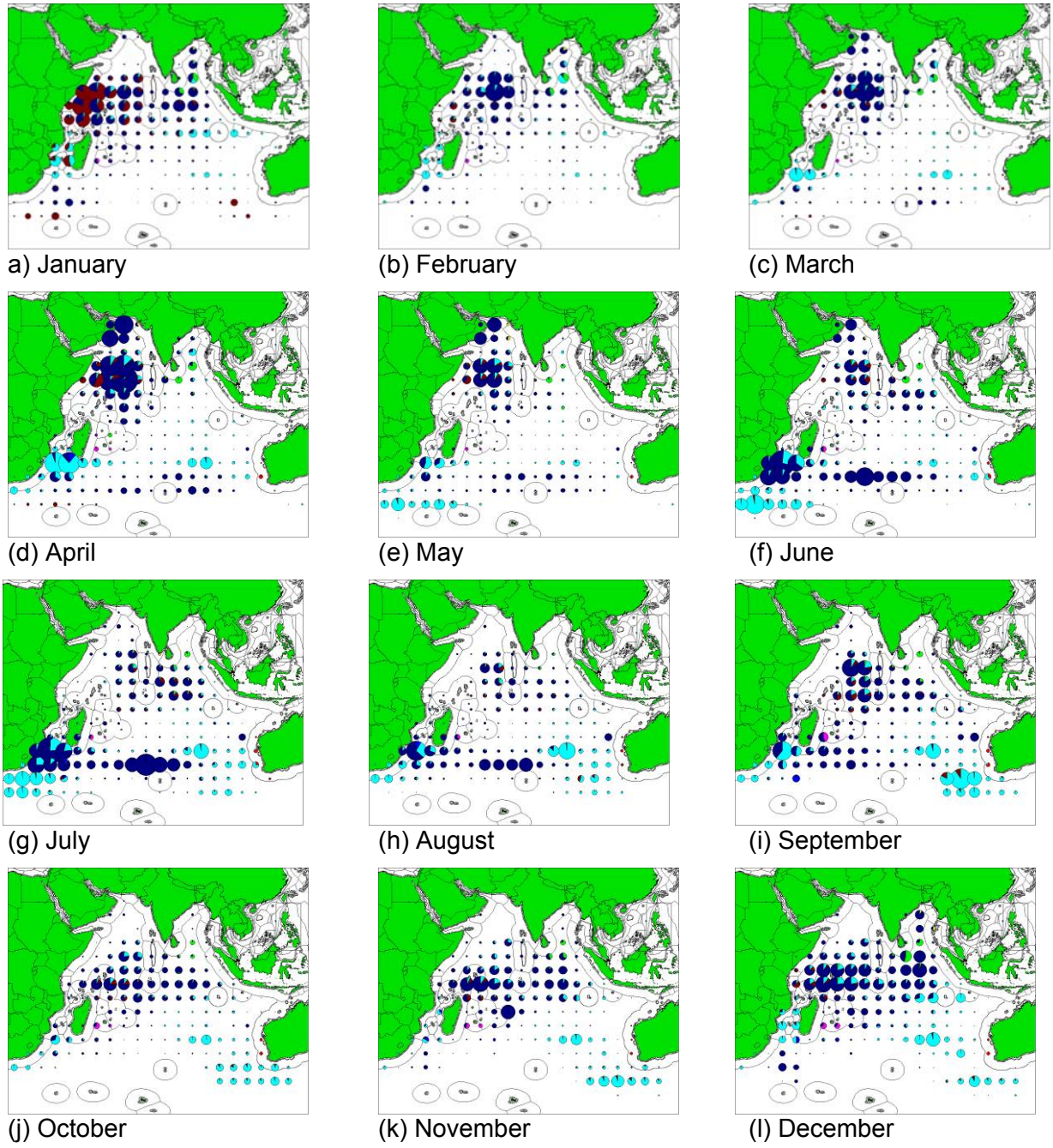


Figure 2 **Indian Ocean deep freezer longline effort distribution (hooks) by flag state by month (a) – (l), (based on total effort 1996-2005).**

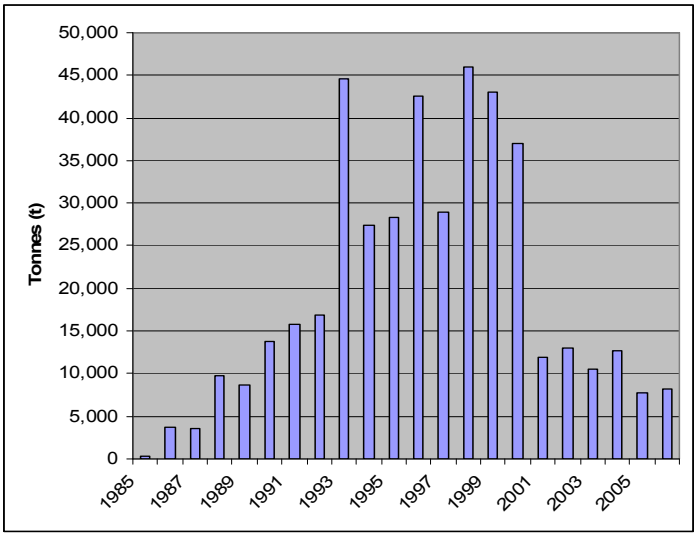


Figure 3 Large deep freezer longline IUU catch (IOTC 2008)

During 2007, there were in excess of 600 port visits in Indian Ocean SADC ports by this fleet sector, which are predominantly flagged in Taiwan, Indonesia, Thailand, Malaysia and the People's Republic of China. Port calls by those flagged in non-contracting IOTC member states (e.g. Panama, Honduras and Cambodia) have also been observed. Precise fleet numbers are not known but these vessels mostly use pelagic longline gear with wire traces[5]. They have an average trip length of approximately 2-3 weeks with a carrying capacity of 40-60 tonnes and target mostly tuna and shark species. There is currently no requirement for this fleet to report to the coastal state concerned by VMS, but direct observations and the independent nature of their operations[6] suggest that they do not fish exclusively outside SADC member state EEZs (particularly **Mauritius, Madagascar, Mozambique** and **Tanzania).**

A major concern is that many of these vessels do not meet the standards set by the IOTC[7], the organisation responsible for the management of the tuna and tuna-like species in the Indian Ocean. Many of them are not registered with the IOTC[8] and do not carry logbooks or report catches in an adequate manner to their flag state. Furthermore, vessel markings are often inadequate[9] and on occasions do not exist at all. Vessels have also been known to change their name during port visits making it extremely difficult for them to be monitored.

There is some evidence of discarding of non-target species from this sector and there is also concern over shark catches. Reports from **Mozambique** indicate that unlicensed longliners [presumably using gill nets] fish for sharks in the shallow coastal waters, often displacing artisanal fishermen. NGO's have recently also reported that local fishermen in some areas are targeting sharks, finning them and then drying the fins to sell to passing "Chinese" fishermen, stimulating further exploitation of sharks in the inshore area (see Section 6.1, Sharks in Peril). There is no consumption of fins in the coastal states, and the market for fins, which are regularly

[5] A wire trace is a short length of high tensile cable or wire, to which the hook is attached. The intention of the wire trace is to prevent sharks from biting through the terminal tackle, so that the sharks will remain attached to the longline.

[6] Given their length class, fuel capability and use of ice for storage most trips are less than a month, although they do transship at sea

[7] The Indian Ocean Tuna Commission (IOTC) is a multi-lateral organisation established under Article XIV of the FAO constitution. Its mandate is to manage tuna stocks and other main tuna-like species of the Indian Ocean and adjacent waters.

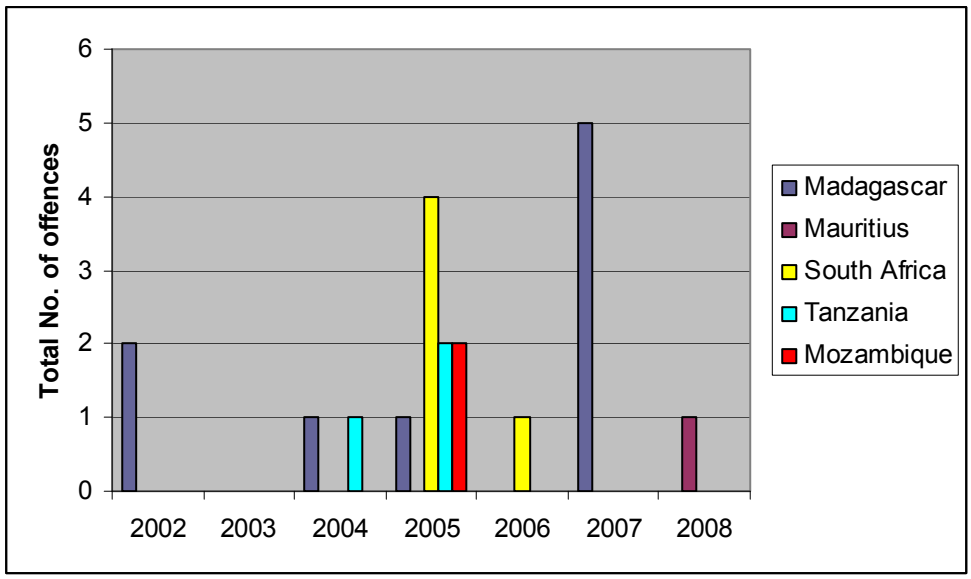
[8] IOTC Authorised List of Vessels (Resolution 02/05)

[9] The National Coastguard (NCG) has also reported in the past observing vessels fishing in the EEZ that have no vessel markings when undertaking aerial surveillance missions

landed in the region, is for export only. However, few if any data on exports are captured through official means.

It is not illegal to land or fin sharks, provided that the fishing operations are in conformity with IOTC Resolution 05/05[10], unless of course there is a specific national regulation concerning the catching of sharks when employing other gear types or for that of conservation. For example, Mozambique has arrested and fined two licensed vessels for catching sharks with bottom set gillnets as this was in contravention of the purse seine licenses they had been issued with. The use of wire leaders on the hooks by the under-30 metre fleet sector however is certainly a topic for discussion concerning shark conservation. In South Africa, shark finning is explicitly banned except when legitimate catches of shark are made in the large pelagic and demersal tuna and shark fisheries.

The total number of serious offences detected in the offshore pelagic sector in each SADC state is displayed in Figure 4. While not representative of the severity of IUU the overall number of detected offences is negligible and the highest detection rate was found to be in Madagascar.



** Namibia's MFMR stated that about 4 infringements occur every 5 years in this sector. This information could not be depicted accurately as a timeline on the graph and no more detailed data were available.*

Figure 4 Total number of offences detected in the offshore pelagic sector in SADC states

It was also reported in the *Daily News* in **Tanzania** on the 6th June 2006 that the Director of Fisheries in the Ministry of Natural Resources and Tourism, Mr Geofrey Nanyaro, informed reporters that 25 fishing vessels were impounded for conducting illegal fishing in the Exclusive Economic Zone (EEZ) of Tanzania in 2004. The types of vessels arrested were however not stated.

3.1.1.2 South East Atlantic Ocean

The fisheries on the South East coast of Africa fall within the Benguela Current Large Marine Ecosystem (BCLME). The International Commission for the Conservation of Atlantic Tunas (ICCAT) is responsible for the conservation and management of tuna-like species in the region and Angola, Namibia and South Africa are all members. The Japanese commercial longline fishery, targeting mainly yellowfin and albacore, expanded from the western Atlantic to the South East Atlantic by the mid-1960's. After 1965 some of the Japanese longliners shifted to the Indian

[10] IOTC Resolution 05/05 concerning the conservation of sharks caught in association with fisheries managed by IOTC

and Pacific Oceans where southern bluefin and other tunas were targeted. The nominal effort in the Atlantic reached a peak of 97 million hooks in 1965 and decreased to 30 million hooks by 1969[11]. With the advent of super cold freezers in the early 1970's sashimi quality tunas could be sold on the Japanese markets and as a result, fishing effort in the Atlantic Ocean again increased to a peak of 56 million hooks during the 1970s. The target species shifted to yellowfin, southern bluefin and bigeye. Effort in the South East Atlantic was primarily concentrated off Angola and South Africa

In **South Africa** large pelagics are targeted by the tuna pole fishery, tuna and swordfish longline, shark longline and sport fisheries. Historically Japanese and Taiwanese fleets, fishing in South African waters under bilateral licensing agreements, were the main participants in the fishery, until these agreements were terminated in 2003. Currently all vessels in this sector have to be equipped with VMS and observers are deployed on 20% of national flag vessels and 100% of foreign flag vessels. Infringements in this sector mostly relate to permit conditions, such as not having the correct bird (tori) lines, or not deploying this mitigation measure, landing shark fins without trunks or exceeding the 8% ratio of fin to trunk weight.

Isolated incidents involving foreign flagged longliners have occurred in recent years.

In April 2004 the Department of Environmental Affairs and Tourism, Branch: Marine and Coastal Management (MCM) inspectors seized 7.5 tonnes of illegal shark fins in Cape Town. It appeared as if the fins came mostly from sharks caught outside South African waters, which were then landed locally, and destined for export to the Far East. In February 2005 an Indonesian flagged longliner, the *Fortune 1*, was arrested on suspicion of fishing illegally for shark in South African waters[12]. South African authorities became aware of the vessel, after its fishing gear became entangled in the equipment of an offshore oil exploration ship inside the EEZ, and they alerted authorities. MCM had supplied the exploration company with the names of all the licensed fishing vessels in the area and they realised the *Fortune 1* was not on the list. One of the patrol vessels was dispatched to intercept the longliner, but was hampered by bad weather. In the mean time reports were received that the *Fortune 1* had left South Africa's EEZ. When the vessel was arrested a week later, upon arrival in Cape Town harbour, they did not have any tuna onboard, but only some bycatch. It was suspected that the vessel had transhipped her catch at sea to a refrigerated cargo vessel.

In August 2005 the Korean flagged tuna longliner, *Oryang 353*, which was fishing on a South African license, was arrested in Cape Town. MCM seized the vessel and arrested the captain on suspicion of illegally fishing for shark. Information was received that the vessel may have been fishing in breach of its permit conditions by finning sharks at sea and dumping the carcases overboard. Their permit only allowed the vessel to catch shark as a bycatch, with catch limits in line with ICCAT conservation measures. Under these the vessel was required to land the whole shark carcass, and not only the fins, to ensure that they don't cut the fins off at sea while the shark is still alive, and dump the carcass overboard. Independent observers, contracted through a private company, but falling under the supervision of MCM, are placed onboard all foreign flagged tuna longliners operating in South African waters. Current measures include very strict conditions regarding mitigation against incidental seabird mortalities, such as deploying bird lines during all sets, night time setting only and a limit of 25 bird mortalities per year per rights holder.

In June 2005 the South Korean fishing vessel *Dong Won 630*, fishing with a South African license, was reported by the observer to be involved in illegal activities such as cutting off the fins and tails of sharks and throwing the live sharks back into the sea. Attempts were also made to bribe the observer not to report their activities to the authorities, and once this failed he was threatened. The vessel was apprehended following a dramatic overnight sea chase involving the

[11] Miyake, M.P.; Miyabe, N.; Nakano, H. 2004.Historical trends of tuna catches in the world. *FAO Fisheries Technical Paper*. No. 467. Rome, FAO. 74p.
[12] Dive South Africa website (*www.divesouthafrica.co.za*)

Ruth First, one of South Africa's patrol ships. The master of the vessel, Hwan Lee-An, received a suspended sentence and a comparatively light fine of R50 000 (US$7 500).

In December 2005 another of the South African patrol vessels, the *Victoria Mxenge*, was undertaking a routine patrol in the inshore area when it came across the Taiwanese flagged *Da Yuan Yu 139.* After repeated calls and signals to stop were ignored, the *Victoria Mxenge* initiated a 'hot pursuit' and requested the assistance of the South African National Defence Force. Two fisheries inspectors were deployed by helicopter on the *Da Yuan Yu 139* to carry out the apprehension. The vessel was escorted back to port where a full inspection was conducted. No fish was found onboard, and the fishing gear was stowed, with no indication of recent fishing activities. The vessel was never the less prosecuted under the Merchant Shipping Act for failing to respond to calls on Channel 16, and fined R200 000 (US$ 31 400).

There are also further anecdotal reports by South African fishermen that they have either sighted or come across fishing gear set by foreign tuna longliners towards the outer edge of South Africa's EEZ. With South Africa's aerial surveillance and high seas patrol capabilities it is however thought that illegal incursion by distant water fishing fleets into the country's EEZ is not a common occurrence.

In **Namibia** large pelagic fisheries were not well developed prior to independence in 1990, as fishing companies were concentrating on the more lucrative demersal, mid-water and pelagic fish stocks. Japanese and Taiwanese longliners were however historically active in these waters as well. Since independence in 1990, a Namibian-controlled tuna pole-and-line fishery started in 1991 by a fleet of about 30 local and foreign-owned vessels. South African longliners also carried on catching tuna in Namibian waters under joint venture agreements with Namibian companies. In 2000 the Namibian Ministry of Fisheries and Marine Resources (NMFMR) introduced "large pelagic fishing" rights to local companies and by 2003 twenty longline vessels were active in this fishery. All vessels allowed to fish in Namibian waters are licensed by Namibia, including foreign flagged vessels which are allowed to operate as chartered vessels, but still need to be issued with a Namibian fishing license to fish within the EEZ.

Some of the management measures in force in the large pelagic fishery are: the ICCAT Catch Documentation Scheme, ICCAT issued TAC's for swordfish and other tunas, gear restrictions (longline & pole-and-line only), that value-added processing is a licence condition for pole-and-line vessels and that there is a system of limited entry (number of licences) in the longline fishery. Since Namibian independence the incidence of infractions by vessels in this sector has been relatively low – averaging about four incidents every five years. Authorities estimate that the total volume and value of fish lost due to illegal activities in this sector is probably also very low.

Most of the large pelagic fishing activity in **Angola** takes place in the southern fishing grounds. The smaller tunas are normally taken by pole and line vessels, but also form part of the bycatch of the purse seiners. The large tunas are generally found further offshore, along the edge of the continental shelf. Bigeye tuna is the major constituent of the Japanese longline fishery, while local pole and line vessels target yellowfin. Data provided by the Instituto Nacional de Investigaçao das Pescas (INIP) for the non-EU tuna fleet showed a total catch of 1 833 tons in 2004. This was divided amongst three groups of vessels; the local atuneiro (literally "tunny boats"; 888t), semi-industrial pole & line vessels (264t) and the pelagic longline fleet, dominated by Japanese-flagged vessels (681t). Two foreign industrial fleets are involved in this fishery. The longline fleet has 18 vessels, and the purse-seine fleet has 15 vessels.

It is likely that incursions occur by unlicensed tuna longliners in the Angolan EEZ, especially along the edge of the continental shelf. Angola has a number of modestly sized coastal patrol vessels to execute fisheries patrol functions (three 9m vessels, and five 10m vessels), but no vessel capable of patrolling grounds further offshore. In a joint operation with the Namibian patrol vessel, F.P.V. *Anna Kakurukaze Mungunda*, in 2004, 6 out of the 16 vessels inspected

were found to have committed serious transgressions and were placed under arrest. These ranged from illegal fishing without a license, fishing within a closed area and using prohibited fishing gear (fishing with a blinder in the cod end of a trawl net). Without the capabilities to inspect vessels out at sea it is likely that similar transgressions are still being committed in Angolan waters. Gianni and Simpson (2005) have also reported significant IUU activity within the periphery of the Angolan EEZ.

During a series of four air patrols under the SADC MCS Programme in 2004, 198 industrial vessels were sighted. From these follow-up actions resulted in 29 serious violations of which 18 resulted in prosecution processes where fines ranged from US$ 5,500 – 66,000. The majority of the vessels apprehended were Chinese/Angolan joint venture vessels (Giroux, 2004).

Although not much is known about the large pelagic fishery in **Democratic Republic of the Congo (DRC)** waters it is likely that given the low MCS capacity of this country, foreign vessels may also be operating illegally along the continental shelf, targeting tunas and tuna like species.

3.1.2 Demersal

Fewer than twenty Mauritian (18-45 metre class) and two Malagasy flagged vessels based in Port Louis, **Mauritius**, are licensed to fish on a number of offshore banks to the North East of Mauritius for demersal reef species using basket traps, hook-and-line, harpoons, large nets and gillnets. Infractions are low with only two cases, both of which were concerned with illegal transhipments to foreign carrier vessels at a remote atoll (cases ongoing and details not yet available).

The outer most banks however straddle the EEZ so it is likely, although there have been no arrests, that there are entry violations by DWFN gill netters from Indonesia and Sri Lanka, that have in the past been sighted by licensed vessels as well as by the Mauritian National Coastguard while undertaking aerial missions (which may also have been fishing in closed areas e.g. marine reserves and no take zones). These vessels also employ longlines and target sharks for fining and have the inherent under / non-reporting issues mentioned above.

There have been reports of a number of known IUU vessels, which previously targeted Patagonian toothfish in the Southern Ocean, and have now converted to bottom-set gillnet gear, targeting nurse sharks (probably tawny nurse shark (*Nebrius ferrugineus*) and shorttail nurse shark (*Pseudoginglymostoma brevicaudatum*) off the west and south coasts of **Madagascar**. The liver oil of these species is apparently a highly sought after and valuable commodity. Tawny nurse sharks are large, tropical inshore sharks, commonly found at depths of 5 to 30 m, and ranging down to at least 70 m on coral reefs. The depth distribution of shorttail nurse sharks is not known, and they are listed as 'vulnerable' in the IUCN Red List of Threatened Species (Nel *et al*. 2007). In August 2007 one of these vessels, the *Ina Maka*, which has been listed on CCAMLR's 'Black List' since 2004, was arrested in Durban after unloading a catch of nurse sharks. The vessel was arrested for falsely declaring to authorities that she had a bottom-trawl net onboard instead of the actual bottom-set gill nets (for which a special permit is required). The vessel operator was found guilty and the forfeiture of the nets, with a value of ± U$ 43 500, was ordered and a fine of about U$ 58,000 (half of which was suspended) was issued.

Some of the other vessels that might be involved in this fishery are the *Ross*[13] (CCAMLR 'Black List' since 2003), *Chilbo San 33* (CCAMLR 'Black List' since 2004), *Red Lion 22* (CCAMLR

[13] The *Ross*, renamed as the *Limpopo*, recently escaped from custody in Maputo, at night, after being placed under arrest by Mozambican authorities. The vessel was not allowed to fish while it tried to apply for registration and a fishing license in Mozambique. The Minister of Fisheries refused to register or license the *Ross* until the current vessel owner was able to prove that it had severed all financial and beneficial interests from the previous owner, who had been involved in IUU fishing. The local patrol vessel was unable to give chase as it was in for routine maintenance. The authorities alerted their neighbours and the

'Black List' since 2003), *Gold Dragon* (CCAMLR 'Black List' since 2003), *Thor 33* (CCAMLR 'Black List' since 2004), *Duero* (CCAMLR 'Black List' since 2004), *Comet* (CCAMLR 'Black List' since 2006), *Rex* (CCAMLR 'Black List' since 2005), *Sargo* (CCAMLR 'Black List' since 2003), *Ulyses* (CCAMLR 'Black List' since 2004) and *Typhoon 1* (CCAMLR 'Black List' since 2006). All of these vessels have been sighted with deep-water gillnets onboard, which they have also been using in the Patagonian toothfish fishery. Gillnets have been used to target toothfish since at least the end of 2005 (Purves et al., 2007).

According to CCAMLR's Combined Vessel Lists Adopted from 2003 to 2007 both the *Ina Maka* (ex-*Black Moon*, *Eolo*, *Dorita*) and the *Chilbo San 33* (ex-*Hammer*, *Carran*) have links with Vidal Armadores, a Spanish company based in Riveira, Spain. Antonio Vidal Pego of Vidal Armadores has a long history of suspected involvement in IUU activities in the Southern Ocean and on 14 November 2006 he was found guilty and sentenced in the Southern District Court of Florida in connection with charges related to obstructing justice and an attempt to import and sell illegally possessed toothfish. He was sentenced to four years probation and ordered to pay a $400,000 fine. Another of Vidal Armadores' vessels, the *Galaecia*, which was previously licensed to fish in CCAMLR waters, is currently authorised by Spain to fish in the IOTC convention area[14] and is also on the 2007 SEAFO Record of Authorised Vessels. This vessel was however also sighted and inspected in Cape Town in November 2007 with a gillnet roller fitted at the hauling station and it is quite possible that they are also currently involved in the nurse shark fishery.

The demersal fishery in **South Africa** and **Namibia** targets mainly hake in deep water and shallow-water hake, monkfish, sole, and kingklip inshore. The fleets are industrial and semi-industrial trawlers and longliners. South Africa also has a deep-water longline fishery for Patagonian toothfish at the distant Prince Edward Islands, a group of Subantarctic islands, lying more than 1700 km southeast of South Africa. This fishery became synonymous with rampant poaching by foreign vessels between 1996 and 1998, which led to a near collapse of the stocks. Within the first two years it was estimated that more than 36 000 tons of toothfish were landed by more than 60 IUU vessels in ports in South Africa, Namibia & Mauritius (Figure 5). The estimated value of this loss to South Africa was more than R3 billion[15]. Catch rates never recovered after the initial high incidence of IUU fishing, and the fishery is currently regarded as marginal. Sightings of IUU vessels fishing in the area are still occasionally being reported by observers on sanctioned vessels, although the IUU fleet has since mostly moved on to other, more profitable, fishing grounds.

relevant RFMO's that the vessel had escaped to the high seas. The vessel has not been re-registered by Mozambican authorities.

[14] IOTC Authorized List of Vessels, April 2008

[15] Known landings in ports in South Africa and Namibia were 23,600 t in 1996 and 12,670 t up to June 1997 (a total of 36,270 t for the first 1.5 years of the fishery) [from: Purves, M.G. 1997. Catch rates and length composition data of the longline fishery for *Dissostichus eleginoides* at the Prince Edward Islands: 1996-1997. SC-CAMLR-XVI/86/28]. The estimated losses wetre calculated using a conversion rate of 1 US Dollar = 4.44850 South African Rand and a market price for toothfish of US$18.60 per kg [ex-vessel prices during this period were claimed to be as high as US$22-26 per kg; Source: The Plight of the Patagonian Toothfish: Lessons from the Volga Case, *Brooklyn Journal of International Law* 30(1): 293-328)].

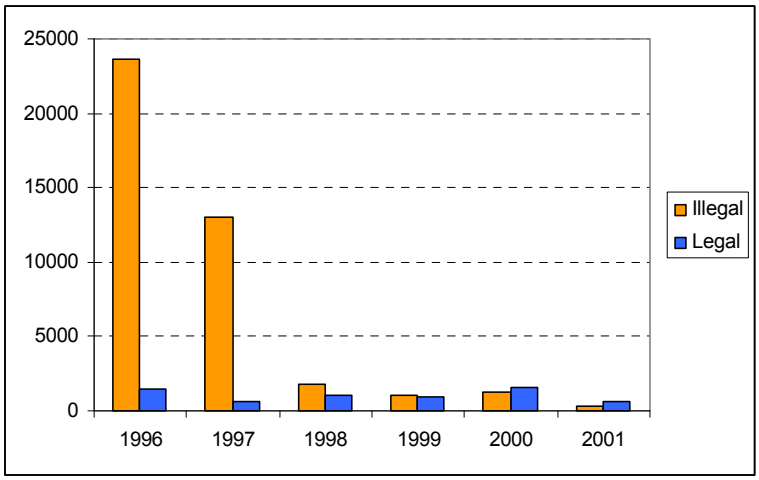


Figure 5 A comparison of legal vs estimated IUU catches of Patagonian toothfish taken from the Prince Edward islands in the late 1990's (data from Purves, 1997 and Brandão et al. 2002)

Recently the South East Atlantic Fisheries Organisations (SEAFO), which counts Namibia, South Africa, Angola and the United Kingdom (on behalf of St Helena and its dependencies, Tristan Da Cunha and Ascension Island), as well as the distant water states - Norway and the European Union - as Contracting Parties, adopted a Conservation Measure[16] to limit the catches of Patagonian toothfish in the Convention Area to 260 tons per year.

Compliance issues in the hake fishery, the most important demersal fishery in South Africa, relate mostly to the misreporting of landings by legal operators, exceeding bycatch allowances of kingklip, reports of high grading at sea (where smaller sized fish of the target species is discarded without being reported in logbooks) and not having adequate bird lines onboard (a recently introduced measure to address incidental bird mortalities). An example of bycatch allowances being exceeded was when MCM seized the deep-sea trawler *Sandile*, which was licensed to catch hake, together with its catch, gear, equipment, stores and cargo, after receiving information that the vessel had allegedly caught over 300t of snoek (a linefish species) as a bycatch and only about 39t of hake during its last voyage. The vessel was suspected of not taking adequate steps to prevent the high snoek bycatch. The highest number of VMS transgressions was also reported for the hake trawl sector, with 35 zone or MPA violations out of a total of 58 (60%) for all the fishing vessels on the system from April 2006 to December 2007.

The hake fishery is also a very important sector in **Namibia**. Prior to Namibian Independence, hake was targeted by a number of distant fishing nations, with Spanish vessels playing a prominent role as well as vessels from the South African fleet. It has been reported that as many as 180 trawlers from Galicia in Spain departed from the Namibian fishing grounds after 1990 to fish in the north-west Atlantic, leading to the now famous 'Turbot War' with Canadian authorities[17]. The impact of these high levels of fishing activity has severely depleted hake stocks, which has still not fully recovered. From 1990 up to now, offences (fishing without a license, fishing in protected areas, fishing with the wrong gear and fishing prohibited species) were evenly spread – with about 4 infractions every five years.

Namibia also has a deep-water fishery for orange roughy and alfonsino, but low catch levels have recently reduced the value and importance of this fishery.

[16] Conservation Measure 10/07 Fixing catch limits and related conditions for the Patagonian Toothfish and red crab fisheries in the SEAFO Convention area in 2008 and 2009.
[17] The turbot war: the beginning of the end (an article by Monica Justo, from Vigo, Spain – translated by Brian O'Riordan) published in *SAMUDRA* April 1995.

SEAFO have also adopted a number of conservation measures to address the sustainability of resources and fisheries compliance in the Convention Area. Conservation Measure 08/06 sets out the procedures for establishing a *List Of Vessels Presumed To Have Carried Out Illegal, Unreported And Unregulated (IUU) Fishing Activities* and Conservation Measure 03/06 sets an *Interim Prohibition of Transhipments- at - Sea in the SEAFO Convention Area and to Regulate Transhipments in Port*. South Africa, Namibia and Mozambique have further also adopted an automatic exchange system with their respective VMS base stations, although this system is not yet fully operational.

Most of the fishermen in **Angola** are from the artisanal sector, which includes more than 4 600 artisanal fishing boats (0-14 m length) and 35 000 artisanal fishers, with an estimated 85 000 persons involved directly and indirectly in the sector[18]. Their activities are mostly limited to the near shore areas, as only around 20% of the artisanal boats are motorized. They target demersal species and lower-value species like groupers, snappers, seabreams and croakers. The industrial fleet targets species such as seabreams, groupers, snappers, croakers and hakes with demersal trawl gear. Violations in this sector often involved vessels entering coastal exclusion zones or fishing without a license and the underreporting and / or misreporting of catches and violations of other management regulations are also relatively common. In a joint mission with one of the Namibian patrol vessels in 2004, two Chinese vessels, the *Liaopu 7816* and *Liaopu 7815* were inspected when it was found they were pair trawling in a coastal area in depths of about 50m. The fisheries inspectors discovered, once the net was hauled aboard, that a piece of net (known in Europe as a blinder and in Namibia as a skad) had been placed inside the trawl, effectively reducing the mesh size. The mesh sizes of the trawl net were also under the legal limit, the vessel's VMS equipment was inoperative, neither vessel was showing trawl signals as required by the International Rules for Preventing Collisions at Sea; nor did *Liaopu 7816* fly any national flag. It was further discovered that neither vessel was adequately marked and that both lacked the name and port of registry at the stern and neither had a fishing vessel identification number painted on the hull[19]. These types of problems with obscured fishing vessel names and identification markings were common place in the Angolan fishing fleet when the SADC MCS Programme were involved in aerial and sea patrols, making it difficult to distinguish between IUU and licensed vessels.

Anecdotal reports from the **DRC** indicate that clashes occur between Chinese industrial vessels and local artisanal fishermen, targeting reef fishes[20]. Reports have also circulated of the Chinese vessels conducting dynamite fishing in the inshore areas, close to Pointe-Noire, and that up to 100 vessels could be involved in IUU fishing. The Deputy Director of Fisheries apparently noted that his inspectors have never been able to observe the alleged IUU activities of the Chinese fishermen at sea. In the newspaper article on *www.congopages.com* the Deputy Prefect of Kayes, was quoted as saying that artisanal fishermen from the Lower Kouilou have lost 69 nets in a month, due to Chinese vessels entering an area 6 nautical miles from the coast, reserved for artisanal fisheries.

3.2 Coastal industrial and semi-industrial fisheries

3.2.1 Crustacean

Prawn fisheries are found predominantly in **Madagascar**, **Mozambique** and **Angola** where some of the largest national industrial and semi-industrial fishing fleets are located. Smaller prawn resources and fleets occur in **Tanzania**.

[18] FAO Fishery Country Profile – Angola (2004)
[19] SADC MCS Programme, Working Paper No. 31, S. Cederrant, Report of the voyage of F.P.V. 'Anna Kakurukaze Mungunda', April – May 2004
[20] Blanche Simona, Guy Parfait Brice Koléla s'engage à faire cesser la pêche à l'explosif. 11 February 2008, www.congopage.com.

The prawn sector in Mozambique and Madagascar is divided into shallow water and a deep-water fishery. In Mozambique, the shallow water fishery consists of a vessel-based quota limited industrial (freezer on-board) fishery and an effort-controlled (limited entry, but no quotas), semi-industrial (no freezer) fishery. The deepwater fishery consists only of an industrial sector. Effort is much lower in the deepwater fishery due to the higher operational costs of exploitation. Additional bycatches in the deepwater prawn sector include lobster, crab, cephalopods and demersal fish species.

Zone violations, despite VMS monitoring in Mozambique, are reported to be by far the most commonly detected offence. Shrimp boats (shallow water) often fish in the shallow water or in the exclusion zone (3nm exclusion zone), with 18 offences detected between 2000 and 2005 within the industrial fishery and 30 since 2005 in the semi-industrial fishery, both on the Sofala Bank and in Maputo Bay. Closed season violations and gear infringements account for the highest number of offences in Madagascar (2nm exclusion zone), with 3 and 7 offences detected respectively since 2002. Violations of the closed season by the industrial and semi-industrial shrimp vessels are not common in Mozambique since the vessels are tied up in port during these periods. In the Angolan shrimp fishery zone violations (inside the 4nm exclusion zone) are thought to be the most common offence by industrial and semi-industrial vessels.

Illegal transhipping of catches, from industrial to semi-industrial vessels is thought to occur in Mozambique and to a much lesser extent in Madagascar, possibly in an effort to remain under the quota allocation. Dumping, discarding and high-grading are also suspected.

As far as illegal fishing is concerned, given the near-shore nature of the shallow water fisheries, which occur over known fishing grounds, with a product that spoils relatively quickly without onboard freezing or cooking, it will require a large vessel to undertake this activity and not land in a domestic port. This seems unlikely given the density of vessels fishing at any given time on the fishing grounds during open seasons. It does not preclude however that illegal fishing may take place in the closed seasons, as there is limited capacity in Mozambique and Tanzania, and to lesser extent Madagascar, to undertake patrols. Madagascar however has no recorded offence for illegal fishing by DWFN vessels and sightings were relatively few and far between during the few patrols carried out by the SADC MCS Programme (in 2003, 2004 and 2005 in Mozambique and Tanzania), as well as during the more recent annual bilateral missions between France and Madagascar and the multilateral missions under the DG MARE financed, Indian Ocean Commission implemented, 'Regional Plan' in 2007 and 2008.

South Africa has a prawn fishery in Kwazulu-Natal, close to the Mozambican border, and fisheries for South Coast and West Coast rock lobster. South Coast rock lobster is endemic to the southern coast of South Africa and is fished commercially up to 250 km offshore along the outer edge of the Agulhas Bank. West Coast rock lobster is a near-shore species found mostly along the South African west coast. Both a commercial and recreational fishery exploits this species.

The South Coast rock lobster fishery became well-known when a two-year investigation, which involved the Directorate of Special Operations or 'Scorpions', MCM and the Asset Forfeiture Unit, led to the conviction and collapse of Hout Bay Fishing in 2002, the conviction of 15 skippers and boat owners and the conviction of 14 government fisheries inspectors who had accepted bribes from Hout Bay Fishing. Arnie Bengis, the head of Hout Bay Fishing, who was involved in extensive corruption and multimillion rand poaching deals, and the company were ordered to pay the state R40 million (then about US$ 3.6 million), which was at that stage the highest penalty yet set in a commercial prosecution in South Africa. In 2004 Bengis was also sentenced by a US Court to 46 months in jail after pleading guilty to three counts of violating the federal Lacey Act (see Section 6.2 'Rock Lobster Magnate behind bars').

Compliance issues in the West Coast rock lobster fishery revolve mostly around the non-reporting of catches (poaching) by both the commercial and recreational sectors.

Rock lobster is the main crustacean species exploited in **Namibia** and the industry is Lüderitz-based. Fishing without a recreational permit, taking out under-sized and lobsters in berry as well as miss-reporting are some of the commonest offences. Namibia also has a small but valuable deep-sea red crab fishery, with only 2 vessels licensed in recent times. There are joint research activities on this species with neighbouring Angola, as it is a shared stock. It is unlikely that there are major IUU issues in this fishery within Namibia's EEZ. The exploitation of deep-sea red crabs on the high seas is protected under SEAFO's Conservation Measure 10/07, which sets a catch limit of 200 tons for each of two Sub Divisions.

Another fishery of importance in the SEAFO area is the **Tristan da Cunha** rock lobster fishery. Due to the remoteness of this group of islands, and their limited enforcement capabilities, they have always been an interesting proposition for IUU operators. In recent times a number of Portuguese-owned vessels landed catches of the lobster species found at Tristan in South African harbours. Populations are however also found on Vema Seamount, a severely depleted fishing ground located on the high seas, which has sustained high levels of fishing over many years, and it was claimed the catches were made there. The fact that reported catch rates of these landings were much higher than what other fishermen have recently reported from Vema, alerted the Cape Town fishing company, who is the sole rights holder for Tristan Rock Lobster in the Tristan EEZ, and the South African authorities, which led to an investigation to try and trace the origin of the catches through genetic profiling (See Section 6.3 'Genetics could catch pirates').

The shrimp trawl and demersal finfish fisheries in **Angola** have significant discards. Kelleher (2005) found that 16.7 % of total landings were discarded.

So while data is indeed scarce and dispersed, in terms of IUU it is predominantly only the 'Us' that are the most prevalent, notably unreported fishing, specifically, that catches, where they are subject to financial instruments to the benefit of a state, such as levies / taxes, are under-declared as well as national vessels fishing in contravention of their licence conditions.

3.2.2 Coastal / Demersal

Dynamite fishing by local communities developed in **Tanzania** in the 1990's. The use of dynamite and hand grenades to catch reef fishes, easily and in large quantities, became widespread and is still ongoing. Recent reports seem to indicate that this fishing method might be making a comeback in some areas along the Tanzanian coastline (See Section 6.4 'Dynamite fishing in Tanzania – scaring the tourists away?').

Mozambique is experiencing increasing problems with illegal fishing in the recreational and sport fishing sectors due to the development of tourism. Mostly South African tourists are involved in infractions ranging from fishing without a license to exceeding bag limits and subsequent illegal export of catches. Since this is a problem that could impact on artisanal fisheries (there are areas where conflicts already exist between recreational and artisanal fishers) it is necessary to resolve border issues at a regional level. This would include monitoring the movements of the recreational fishermen, as well addressing the taking of catches above established bag and fish size limits, the unauthorised processing and sale of resources such as lobster, abalone, crab, ornamental fish, various species of conch, sea cucumbers and shark fins and fishing without a license.

In **South Africa** about 3 000 commercial and 500 000 recreational permits are issued in the linefish sector annually. Stocks of many of the species have been declared "collapsed" or "overexploited" due over-fishing caused by little or no enforcement during preceding years. It

became a criminal offence to harvest or have in your possession any of the "collapsed" species and a linefish recovery plan was implemented, incorporating marine protected areas for stock recovery. In September 2007 seventy armed fishermen allegedly invaded the Tsitsikamma protected area and spent the day fishing illegally following MCM's proposal that the area be partly de-proclaimed to allow line fishing[21]. The Minister however decided to uphold the "no take" policy in MPA's, as recommended by scientists, and not allow recreational fishing in the area. There is however still simmering political tension around the issue of conservation vs. the right of so-called 'subsistence' fishermen to exploit the marine resources, even in protected areas. IUU fishing in this sector is ongoing and in December 2007 MCM confiscated almost a ton of linefish, mostly red steenbras, caught with a local vessel, the *Atlantic Blessing*, and criminal charges in terms of the contravention of the Marine Living Resources Act were being investigated. Recently MCM introduced a land-based observer scheme to monitor catches taken by rights holders and recreational fishermen in this sector.

There have also been reports of incursions into the Pondoland Marine Protected Area, on the border with Mozambique. In May 2006 the South African patrol vessel, *Sarah Baartman*, arrested a small fishing boat, which had caught four tuna and a line fish inside the MPA. During the same patrol a Mozambican flagged fishing vessel, the *Twanano*, was also caught fishing inside the St Lucia MPA. The owner pleaded guilty to four charges under the Marine Living Resources Act, relating to fishing in South African waters without a foreign fishing vessel license, possessing fish in a marine sanctuary, as well as fishing and anchoring in a Marine Protected area, and was sentenced to a fine of R500 000 (about US$ 71 000), with R400 000 being suspended for 5 years. The skipper was also sentenced to R500 000, which was wholly suspended for 5 years. South African authorities had long suspected that vessels were entering the MPA from Mozambique, usually at night, but being equipped with modern radar they were difficult to intercept, as they would stay close to the border and flee as soon as they suspected authorities were in the vicinity.

An important issue highlighted by this case is the lack of defined maritime borders between many of the countries in the region. . Fishermen are often aware of this and take advantage of it.

In **Angola** there are more than 4,600 vessels and 35,000 fishers active in the artisanal fisheries. They operate in the inshore zone (up to 4 nm), but may venture further out (e.g. to 8nm), provoking conflicts with industrial and semi-industrial vessels. Artisanal fishers catch demersal and lower-value species like groupers, snappers, seabreams, croakers and spiny lobsters.

Some of the IUU problems encountered in the artisanal fisheries are the use of the *banda banda* beach netting method, and the use of poisonous roots or plants and explosives. The use of gillnets by IUU industrial vessels in inshore areas has also been reported.

3.2.3 Small pelagics

The small pelagic fishery, targeting both anchovy and sardines, is **South Africa's** largest in terms of volume landed. Catches can fluctuate, as these short-lived species are prone to massive recruitment swings. Fishing grounds are in the inshore areas on both the West Coast (sardines and anchovies) and the South Coast (sardines), and purse seine nets are deployed from wooden, GRP and steel hulled purse-seine vessels, ranging in length from 15 to 30m. South Africa also has a mid-water trawl fishery for horse mackerel, operating exclusively on the East Coast. Compliance issues in the small pelagic fisheries mostly relates to the misreporting of catches. Resource monitors and fisheries inspectors monitor the landing of catches, but despite this there have been persistent reports of scales being tampered with to under-read landings at some factories. There have also been reports of dumping of catches at sea. In some cases a vessel might only need a relatively small quantity of fish to fill the holds at the end

[21] Published in: Legalbrief Environmental, Issue No: 0028, 18 September 2007.

of a voyage, and a last haul is made before returning to port. If these hauls hold more fish than can be accommodated onboard, dumping of excess fish sometimes occurs. Skippers are encouraged to rather pass on the excess fish in their nets to other vessels fishing in the vicinity and to target smaller quantities when their holds are almost full. Once these fish are caught and then dumped they do not survive and are lost to the fishable population. A comparison of catch figures of vessels with observers onboard compared to those without observers onboard also indicated differences in catch composition, possibly indicating dumping or deliberate targeting of some bycatch species[22]. Some dumping of catches, unaccounted for in logbooks and landing declarations, is however taken into consideration when doing stock assessments by adding a correction factor (a percentage of unrecorded losses due to fishing mortality) to assessment models.

In 2003 MCM launched an investigation into reports that vessels landing sardine catches in the small port town of Mossel Bay were systematically underreporting and not declaring catches. These offences allegedly involved a fraudulent partnership between a fisheries inspector, several resource monitors and fishing companies and their skippers. Court cases are still ongoing, although some of the people involved have already been convicted (See 6.5 Small Pelagics Fraud).

The small pelagic fishery in **Namibia** has never fully recovered from the collapse in the 1960's (Boyer & Boyer, 2003) and recently there has been a drastic reduction in the TAC for sardine from 25 000t in 2006 to 15 000t in 2008. One of the explanations offered for the stock declines is the environmental variability in the Benguela ecosystem. This is currently the focus of long-term studies to determine if the oceanography that underpins the biological process has been altered. An alternative suggestion is that fishing pressure combined with unregulated and / or unreported fishing is having a major impact, exacerbating the environmental effects.

The mid-water trawl fishery for horse mackerel is, along with the demersal trawl fishery for hake, one of Namibia's most important fisheries sectors. Land-based monitoring and control of fisheries in Namibia is relatively easy as there are only two major ports, namely Walvis Bay and Luderitz, where catches can be landed. All discharges are monitored and Namibian licensed and flagged vessels also carry observers on 100% of their trips, increasing the sea-based monitoring capabilities of Namibia's fisheries authorities. The data from regular scientific surveys are used in stock estimates and this data, together with the catch and effort data of the fishing vessels, are used to determine total allowable catches.

Namibian authorities report that offences in the mid-water trawl sector are relatively high when compared to the large pelagic and demersal fisheries, averaging about one per annum since Independence. Fishing without a licence is probably the most serious offence.

In July 2005 the captain of one the licensed mid-water trawlers in the fishery was arrested for fishing in a restricted area after being spotted during a routine fisheries patrol and boarded by fisheries inspectors. The captain was charged with contravening the Marine Resources Act and the fish on board the vessel was impounded. The outcome of the case is not known[23]. More recently, in October 2007, observers onboard some of the horse mackerel vessels alleged that systematic and selective dumping was taking place in the processing of the catch, with smaller fish being removed and dumped, before it reached the main factory floor of the vessel. Seven of the licensed mid-water trawlers were ordered to port for further investigations. One of them, the *Kiefskya Rus*, absconded in November and set off to the high seas to escape from the authorities. In December 2007 four of the vessels were permitted to return to sea to fish for their 2007 quota under conditions set by the Ministry of Fisheries and Marine Resources[24]. The two

[22] Analysis done by MCM Small Pelagics Sector.
[23] *The Namibian* newspaper, 28 July 2005
[24] *The Namibian* newspaper, 14 December 2007

remaining vessels are still under the custodian of the Minister in Walvis Bay. Up to now no further information is available in relation to charges against the vessels or companies involved.

The dumping of fish and high grading (retaining only better quality/size fish) is not only wasteful in terms of protein, but it also seriously affects the data on which stock assessments are based by masking stock structure and incorrectly reflecting actual recruitment to the fishery. If such a practice is common place enough, it will result in skewed stock estimates that generally lead to an over estimation of the health of the stock. This in turn can lead to underestimates of fishing mortality of the target species, and ultimately stock depletion.

The fishery for small pelagics in **Angola** forms a major part of this country's fisheries. Small pelagics are targeted by industrial and semi-industrial pelagic trawlers, and also by purse seiners (for sardinellas, sardine, horse mackerel and others).

In 2004 pelagic trawling was banned to allow stocks to recover, yet this practice continued, also by vessels that were licensed for purse seining rather than pelagic trawling. Purse seine licensed vessels (for small pelagics) were also found fishing with trawls (both demersal and pelagic)[25]. In 2004 as part of aerial surveillance missions, which were initiated through the SADC MCS Programme, vessels were caught pelagic trawling when this fishing method was prohibited. Of the vessels apprehended between 2003 and 2005, some 13% were fishing illegally without licenses. These were largely national pelagic trawl vessels, but also included some Japanese longliners. A further 21% were caught during the closed season, which indicated an invalid license and a lack of intention to declare catch.

3.2.4 Fisheries for Sedentary Species

Reports are surfacing of artisanal fishers who are catching and drying sea cucumbers in **Mozambique** to sell to 'Chinese' fishers / traders and local custom institutions have already gathered concrete data on this illegal trade.

IUU fishing of abalone in **South Africa** has been well documented and reported, and has recently led to a suspension of the commercial fishery to protect stocks. This is seen as a drastic measure to prevent the resource from a total collapse due to rampant poaching. IUU fishing in this sector has strong links with illicit trade networks, drug trafficking, money laundering, corruption and racketeering. The South African Revenue Service is also working closely with police and other law enforcement agencies in a bid to stem the flow of poached abalone from South Africa, mostly to the Chinese market. Recent convictions of poachers in this sector have been prosecuted under Section 2 of the Prevention of Organised Crime Act, in addition to the regulations of the Marine Living Resources Act. It is estimated that IUU abalone from South Africa could be worth about R1.2 billion on South East Asian markets per year. Poaching in this sector is currently the biggest problem with IUU fishing in South Africa.

3.3 Artisanal fisheries

There is an incredibly broad range of artisanal fishing practices within the SADC states, including drifting or static gillnets, beach seine nets, staked gill nets, fish corrals, fish traps, trolling lures, jigging, handlines and longlines, which all report to have recorded offences. Many of the countries in the region also have difficulty in distinguishing between artisanal and subsistence fisheries, leading to problems in the monitoring and control of these fisheries. It is generally accepted that subsistence fisheries do not require a license to fish.

[25] SADC MCS Programme, 2004. Giroux, F. (2004) Review of Aerial Fisheries Patrols of the Angolan Maritime Waters. September 2004. Working Paper No 29.

In all the East African SADC states many of the artisanal practises have apparently been transformed, at least near urban areas, into a small-scale industrial fisheries, which come with an increased number of detected offences.

Catches in general are poorly reported and unregulated and minor offences if detected are not recorded, maintained or aggregated in a usable form. Simply obtaining fleet data and maintaining fleet registries presents enormous challenges to countries and budgets are simply not available on the whole to carry out such extensive inventories. In general, from the information available, the most common illegal practices in artisanal fisheries appear to be fishing during closed seasons or within closed areas and using illegal gear. Destructive fishing practices such as dynamite and cyanide fishing also appear to be a problem.

Many of these offences in the artisanal sector are however driven by necessity rather than profit-seeking as in the industrial sector. Often artisanal fisherman will fish in closed season or areas as they have no other options of income or food, e.g. in Mozambique the closed season in the prawn fishery coincides with periods of low agricultural output. This is often exacerbated by poor implementation and inadequate consultation of local fishers in decision making processes, resulting in fisherman finding their traditional fishing grounds off-limits.

4 Factors influencing IUU

There are insufficient cases in the offshore and artisanal sectors for detailed analysis of IUU type and level, however based on information collected, persons consulted and common perceptions of the real IUU drivers, the following section looks into factors that are thought to influence the nature and scale of IUU fishing in the SADC region.

4.1 Governance and political will

It has been proven that there is a significant relationship between governance and IUU (MRAG, 2005) and it goes without staying that those operators involved in IUU will take advantage of the weak, and in some cases non-existent institutional structures in those countries with the lowest governance indexes, to line their pockets. However, a more critical consideration and one that is often more complex to tease out, that ensures effective MCS and *de facto* sustainable management of resources in the region, is the degree of political will and commitment to the implementation and support of any regional initiative targeting IUU.

Both the actual and potential economic profiles of the fisheries, relative to each of the national economies, and seen in the context of often more pressing social issues, was seen to be the determining factor governing the extent of political support for fighting and indeed the requirement to eradicate IUU.

4.2 MCS capacity

SADC states have been strengthening their MCS capacity over the last 5 years to prevent, deter and eliminate IUU fishing, albeit in varying degrees. Initially this was done through the operational, strategic and institutional capacity building programmes of the EU funded SADC MCS Program as well as more recently through donor support from NORAD and the World Bank. On the whole capacity still remains weak, but IUU does not appear to necessarily thrive in those countries with the lowest capacity. The value of potential catches is another important driver for IUU activity in a particular region. Furthermore, the effects of a low MCS capacity were not restricted to small MCS budgets and a lack of vessels and fisheries inspectors.

The main MCS capacity issues that appeared to have direct influences on IUU in the region include:

- Limited knowledge of the scale of IUU activities in the region
- Limited regional assets and capacity
- Extensive size of areas requiring surveillance and significant dispersal of fleets
- Limited, and in many cases non-existent coordinated systems for MCS regionally, or even bilaterally in targeted areas facilitating joint deployment or 'pooling' of means
- Absence of any directed body to regionally oversee MCS activities and information exchange

IUU is an ever evolving complex combination of activities and ranges in the SADC region from underreporting or misreporting of catches by legitimate operators, sophisticated schemes of laundering fish to circumvent international trade measures and elements of organised crime syndicates as well as blatant violation of coastal states EEZs and conflicts between unlicensed foreign vessels and local artisanal fishermen. There have been countless desk studies often using the same material as well as a barrage of unconfirmed anecdotal information sources, but

the fact remains that with the exception of IUU case studies in South Africa there are virtually no solid data sources on the true scales of IUU fishing in the SADC region[26].

Aside from illegal operators where data is almost always absent, underreporting or absence of reporting is common, and given the disjointed and uncoordinated inspection regime in place, the limited resources cannot effectively assess or indeed begin to address the problem.

The combined EEZ area of the East African SADC coastal and island states alone is comparative to the entire EEZs of the European Union (approximately 5 million kms²). It goes without saying therefore that patrolling areas of this immense size, to monitor for example highly migratory fleets, that are themselves often very difficult to detect,[27] is technically and economically challenging. However, the foreign fleet sectors involved with IUU often use the port facilities of ports of the region, as it is not always feasible to tranship/bunker at sea or return to Asia every 3-4 months[28]. Although improving in some of the SADC states, weak port inspections and a lack of exchange and coordination in the information they generate does not sufficiently address the problem. This is true of other such national MCS baseline data (e.g. licence data, vessel registry information etc.) as well as those data captured at sea, and on land, which is not currently processed and stored in a harmonized way, either nationally and certainly when considered in a regional context. This is exacerbated by the absence of any directed body to regionally oversee MCS activities and information exchange.

Different users within the regional fisheries sector (e.g. port inspectors, coastguard, national administrations, navy, RFMO's etc.) all have their specific requirements in terms of data format and availability. However, there is currently no 'common' effective information infrastructure that would allow retention and exchange of MCS data on land. Similarly, harmonised data security policies are absent. This deficiency acts in effect as a barrier to data dissemination even to institutions and individuals authorised to use it. An appropriate diplomatic environment does however exist within the SADC region for efficient data sharing to take place. This is hampered by current data standards, data holding capabilities and data confidentiality policies, which remain inadequate for a coordinated approach to MCS information exchange. Current systems are focused towards domestic requirements at the expense of regional utility, which is a significant barrier when fighting the nature of IUU at work the SADC region (See 6.6 A 'Low-cost Regional information sharing tool to combat IUU').

All of the SADC states with the exception of DRC and Angola have operational VMS systems. The existing systems have however been designed to address national requirements, specifically to monitor both domestic and licensed foreign vessels. Again there are no 'effective' regional standards (including minimum specifications etc.) for exchange of VMS information between states. Although VMS standards are included in the SADC Protocol, signed in 2004, it has been reported that due to continuous staff changes, and the absence of a single responsible agency to make sure they are implemented, their effectiveness is minimal. Given this, it is clear that existing VMS capacity in its current form cannot address the regional monitoring shortfalls presented, particularly by the small Asian longline sector, acknowledging the fact that the flag states in this case are not from the region.

[26] The IOC MCS Project is tasked with obtaining quantifiable estimates of IUU, however this is confined to IOC member states (Comoros, Madagascar, Mauritius, Seychelles and Réunion (on behalf of France).
[27] Asian ice longliners are relatively small vessels constructed from wood and/or fibreglass and on the whole have poor vessel markings
[28] Freezer longliners (45-55 metres) and small ice longliners (20-30 metres) will all need to re-fuel between 90-120 days (Eastward & Exim Shipping, Tawian, pers. comm.)

4.3 Legal framework and RFMOs

The RFMOs [of geographical relevance to this study] with specific 'management mandates' for the stocks they are concerned with are IOTC and ICCAT for tuna and tuna-like species and SEAFO and SIOFA for all non-tuna species falling within their convention areas.

With Mauritius and Madagascar being two of the first, and Tanzania the most recent, all SADC Indian Ocean coastal and island countries are members or Cooperating Non-Contracting Parties of IOTC with the exception of Mozambique. South Africa is a Cooperating Non-Contracting Party and IOTC encourages this to be a pre-cursor to membership (IOTC pers comm).

Simply being inside or outside of an RFMO does not appear to be a contributing factor for the scale or nature of IUU that a coastal state experiences. Indeed fleets from some of the longest standing members if IOTC now present some of the most pressing issues and concerns.

IOTC Resolutions endorse that contracting parties should control their own fleets by a variety of control measures, including but not limited to: authorizing vessels to fish on the high seas[29], monitoring the activities of their fleets through compulsory data reporting schedules/formats and VMS monitoring as well as penalty systems that discourage non-compliance. However the contracting parties can only implement these if the measures are integrated into national law. It is evident however that almost all of the SADC Indian Ocean states do not possess the legal capacity to do this. Furthermore, the framework of the laws in many cases are too weak to accommodate such measures as the laws themselves are not well adapted to even some of the more basic MCS legal instruments such as the FAO Code of Conduct for Responsible Fisheries, the 1995 UN Fish Stocks Agreement, the FAO Compliance Agreement and the four FAO International Plans of Action. That is without even delving into some of the more technical legal tools, acknowledged as efficient in fighting IUU (e.g. Lacey Act clauses, evidential value, traceability terms and powers of enforcement). [NB. Making amendments to Acts or indeed creating new Acts or Regulations involves a significant amount of inputs, council and advice. However each year new Resolutions are passed, such that states simply find themselves with a backlog of technical measures that they are now obligated to fulfil, will make them less and less likely to do so.]

From a regional perspective, there are limited formal or diplomatic mechanisms or frameworks in place between SADC states to allow exchange of data (e.g. VMS, operational data, port movement data, vessel landing information etc.), regional surveillance, regional logbook reporting schemes and regional information systems, and so effective collaboration in MCS operations has up until now been restricted.

When strengthening MCS systems towards fighting the IUU activities at play it is essential to strengthen the existing domestic legislation to ensure that it prescribes measures that are appropriate to achieve the desired fisheries management objectives and contains provisions that facilitate effective enforcement. In practice, the effectiveness of SADC MCS systems in ensuring compliance with the laws and RFMO obligations will depend very heavily on whether or not domestic laws provide appropriate mechanisms to facilitate this task and for this they need support and a structured step by step plan assisting them to meet these challenges.

Work carried out by the IOC-MCS Project has resulted in new laws in Madagascar and Mauritius as well as a series of Regulations, however this has taken over two years. It is hoped that legal reviews will soon be extended to cover Tanzania supported by IOTC. Mozambique is currently reviewing its fisheries legislation for inland fisheries whereas the Marine Fisheries' Regulation (REPMAR), which aims to tackle many IUU issues, has already been approved.

[29] A legislative study completed in 2001 (Cacaud, FAO, 2001) of selected Indian Ocean coastal states has shown that legislation often does not cover the high seas

4.4 IUU fleet characteristics

4.4.1 Nationality

Most **Illegal** fishing is carried out by non-coastal state vessels. These are generally nationals of China, Korea, Spain, Russia and Indonesia; although in most cases the vessels tend to be flagged predominantly in either China, Taiwan, Korea and Indonesia or fly other flags of convenience such as Equatorial Guinea, Cambodia, North Korea and Tonga[30]. In the industrial and semi-industrial fisheries zone violations by these vessels occur frequently, however the true scale is poorly known. Vessels involved in transgressions often have joint venture partners in these countries, but in many cases these partners do not have much control over sea going operations. The authorities often license such vessels, but due to the lack of thorough at-sea and port inspections, compliance with regulations is often low. In some cases fishing licenses are issued to vessels without them ever entering the ports, or being inspected by officials of the issuing country. Conversely vessels that are not issued licenses are still permitted to be 'based' at the coastal states port where their movements within that coastal states EEZ is not monitored (e.g. by VMS).

Most **Unreported** fishing is probably within the domestic fisheries and also in the offshore fisheries again by the Asian longline class-type vessels. This situation is true for fisheries in Mauritius, Madagascar, Mozambique, Tanzania and Angola. As previously mentioned most of the Indonesian and Taiwanese flagged vessels do not routinely use logbooks and when they do, they do not record and/or report all the species they catch in any useable format for management purposes. In South Africa and Namibia unreported fishing offences are often committed by their own nationals and/or on vessels flying their own flags. This is probably due to the effective MCS capacity in both these countries and their insistence that most vessels fishing in their waters have to fly their flags, ensuring better port state control over their activities.

Unregulated fishing is predominantly found in the artisanal sector, which is prevalent in all the SADC countries, with the exception of Namibia and South Africa. In these countries their nationals are often involved in IUU fishing in their own waters. Transgressions are mostly under- and or misreporting, fishing of prohibited species or exceeding catch limitations on bycatch species, high grading of catches at sea (dumping) etc. Vessels involved in IUU practices are usually also licensed by the authorities and flagged in these countries. Incursions by foreign flagged vessels are rare and when it occurs, such as in the case of Patagonian toothfish at the Prince Edward Islands, it is due to exceptional circumstances. In the latter case a combination of the remote location and harsh conditions made enforcement difficult.

4.4.2 Operations

Fleet operations and their respective involvement with the varying types of IUU activities encountered can be best summarized and ranked in the following way (1 being the highest level):

1. **Artisanal & handline fishing**

1. Misreporting / non-reporting
2. Gear violations
3. Closed season violations

[30] The Fair Practices Committee of the International Transport Workers' Federation has produced a list of 32 countries declared as Flags of Convenience (FOC's); www.itfglobal.org.

4. Size and species violations
5. Prohibited and destructive fishing methods

Why? There are a high number of fishers fishing in already over-exploited areas.

2. Small ice ("wetfish") longliners:

1. Misreporting / non-reporting
2. Fishing without licences
3. Closed area violations

Why? A large fleet which is increasing (over 1500 vessels) with significant levels of misreporting and often fishing without licenses.

3. Trawls vessels:

1. Misreporting / non-reporting
2. Gear violations
3. Closed area and season violations
4. Dumping and high grading
5. Transhipping at sea

Why? An ageing fleet but high number of infraction types

4. Freezer longliners:

1. Contravention of licence conditions, such as targeting sharks with a tuna licence (e.g. Mozambique),
2. Catching sharks in contravention of IOTC Resolution 05/05
3. Illegally transhipping.

Why? An aging and shrinking fleet with significant levels of underreporting in some areas.

5. Purse seine:

1. Under declaring catches and/or misreporting catches
2. Closed area violations

Why? A relatively small and fixed fleet operating on the whole legitimately

4.5 Geographical location

A state's geographical location was found to be one of the most important, and in many ways the most obvious factor, contributing to the level of IUU fishing experienced. The potential value and

abundance of fish stocks in a coastal state's EEZ, would generally lead to an increased demand, with some operators always willing to try to evade the law to obtain the maximum financial gain. The richness of resources linked to inadequate capacity, weak governance, a lack of information or knowledge and/or a functional legal framework to control IUU activity, are the main drivers determining the levels of IUU experienced by a particular state.

5 Impacts of IUU

5.1 Rationale

It is important to clearly understand the importance of the fisheries sector and the nature of the IUU activities at play in each of the SADC member states. This information will allow an improved assessment of the impacts of IUU that are caused directly or indirectly by the IUU activities. The analysis of the impacts takes into account a range of issues including the stocks, landings, national revenues from fishing agreements, licensing, fish processing within each country, fish prices as well as social issues relating to fisheries.

The IUU impacts in this study were grouped into three categories: Economic, Ecosystem and Social, as well as several subsidiary categories for each of these three main categories. The impacts caused by the different IUU activities (offence type) in each category were then scored as High, Medium or Low across each fishery sector and country.

Economic:

1. Direct loss of revenue

This includes economic losses caused by vessels catching fish without a licence in a coastal state's EEZ and then landing their catches in another country, thus depriving all downstream income generation as well as licence revenue to that coastal state. This does not include the loss of catch value or a proportion thereof as in many cases within the SADC region countries may not have the desire or capacity to catch the resource themselves[31].

2. Indirect loss of revenue

Categorised as a loss of revenue to the coastal state through domestic offences and technical infringements. So the resources are still landed and retained within the coastal state where it generates downstream benefits such as processing, however impacts are experienced on licence revenue.

3. Downstream loss of revenue

Includes losses to a state in providing downstream activities on the assumption that IUU vessels will land in a different coastal state to where they have offended. Downstream activities include port fees, support services, fish handling, chandlery, and fuel sales etc. In some cases a loss in one country may result in a gain another, e.g. a vessel catches tuna illegally in Mozambican waters and then uses port facilities in South Africa for fuel, chandlery goods and transhipment of the catch. Downstream losses of revenue also includes impacts on tourism and revenue from affected marine environments.

Ecosystem:

1. Target stock status

Effects on the target stock status include an assessment of the impacts caused by IUU activities on the target stock within a fishery. These will include factors such as the reduction in biomass, spawning stock biomass etc.

[31] Mauritius has attempted to start its own tuna industry with failed attempts in both the purse seine and longline sectors. Main factors included lack of financial backing, inexperience in the fishery and a lack of skilled skippers.

2. Bycatch stock status

Effects of IUU fishing on non-target fish stocks encountered within a fishery. These effects will typically be through increased bycatch, discarding or other linked causes (e.g. seabed degradation caused by bottom trawling), including impacts on benthos and sedentary species. These may simply be caused by the increased level of effort beyond that normally experienced by the licensed fishery or the use of more destructive fishing techniques e.g. smaller mesh sizes often employed by the IUU fishing fleets.

3. Incidental Mortality

Effects of IUU fishing on other animals that are impacted by the fishery. These effects will typically be through the use of more damaging fishing techniques e.g. wire traces and choice of hook types in IUU tuna fleets catching sharks and turtles at a higher rate than the legal fleet and the increased incidental mortality of seabirds of the IUU fleet operating without streamer lines and line-weighting systems in place.

Social:

1. Food security

Impacts the IUU activities have on food nutrition availability and quality in the local communities.

2. Fisher conflicts

Impacts caused by conflicts between illegal operators and legitimate domestic fishers.

3. Safety

Impacts on the safety of artisanal fishers caused by IUU vessels, e.g. trawlers encroaching on inshore waters at night come into increased contact with small poorly lit vessels that do not show up on the industrial vessel's radar.

5.2 Impact matrix summaries by country

5.2.1 Synthesis of findings

The 'indirect losses' are considered to be relatively low in the offshore large pelagic sector as with the exception of South Africa, Namibia and Angola, none of the countries have fleets directly participating in the fishery. A report produced by the IOC-MCS Project showed that revenue derived from licence revenue (including EC FPAs) only amounted to 3% of all revenue generated in the tuna fishing sector. Revenue generated by port activities and processing brought by far the most economic gain. The number of port calls and the nature of the services those vessels receive from the coastal states has a more 'direct impact' on the economy than whether or not those vessels are licensed. It follows therefore that downstream losses tended to be low in the region, indeed downstream losses experienced by one state could in fact be considered as a gain to another.

Ecosystem impacts in the offshore large pelagic sector was also seen to be low to medium across the SADC region as the proportion taken by the IUU sector is comparatively low. However the situation may change if the biomass of these stocks drops below MSY, which is not yet the case for any of the tropical pelagics, and if the problems of misreporting are not controlled. The medium impacts that were recorded reflect the concerns over shark catches. Given the limited direct participation by SADC coastal and island states in the fisheries, either by

having fleets or reliance on tuna as a main protein source, social impacts were also thought to be fairly low across the region.

Both the coastal shrimp and demersal reef fisheries are seen to be subject to the most serious impacts. 'Indirect' economic impacts were seen to be the most widespread as national fisheries cause most of the offences; such that the resources, albeit caught in contravention of conditions, are generally kept within the economic cycle of one country. The highest impacts in this sector are thought to be on the ecosystem, particularly on both the target resources and on bycatch and discards species. This is to be expected as shrimp fisheries have one of the highest ratios of bycatch to landed catch. These problems are exacerbated in the region as little of this bycatch is landed by the industrial fishing fleet, some of the catch is discarded and some of it is transhipped to semi-industrial and artisanal vessels. Bycatch is generally not verified and often captains get paid directly for fish. Social impacts are also high within this fishery as there are direct conflicts between the industrial and artisanal (beach seine and other) fisheries when fishing in the inshore areas. These include impacts on food security of coastal communities and loss of fishing gear through entanglements, constraining their ability to fish.

'Indirect losses' through the misreporting or underreporting by participants are considered to be the main issue in the demersal and small pelagic fisheries. Ecosystem impacts are also an issue with bycatch. Social impacts in these industrial and semi-industrial fisheries are relatively low as there is little direct competition between the IUU sector and local communities for resources. Elaborate schemes by IUU operators to increase their catches or their catch value (through high grading) can cause losses of revenue and if continued for long enough could have serious biological impacts.

The impacts on coastal sedentary fisheries in the region is mostly an issue in South Africa, which has large scale poaching of abalone which has been linked to organised crime. The closure of the fishery was an attempt to save dwindling stocks. Social issues revolve around the loss of income experience by legitimate fishermen as well as safety issues experienced by enforcement personnel and links to the drug trade. The economic losses to South Africa are huge as catches are often smuggled out of the country and exported from neighbouring states to avoid detection by customs authorities.

5.2.2 Angola

IUU level >		High				Medium		Low	Low	
Impacts		Shrimp and demersals				Small pelagics		Tuna	Artisanal	
		Closed area	Zone violation	Unauthorised gears	Unlicenced (or wrong licence)	Unlicenced / wrong licence / gear	Zone violation	Unlicenced	Destructive gears	Miss reporting
Economic	Direct loss of revenue	M	M	M	M	L	L	L	M	M
	Indirect loss of revenue	L	L	L	L	L	L	L	L	L
	Indirect downstream loss of revenue	L	L	L	L	L	L	L	L	L
Biological	Target stock status	H	M	M	M	M	M	M	M	M
	Overlap stock status	M	L	M	L	L	L	M	M	M
Social	Food security	L	M	M	L	L	M	L	L	M
	Conflicts	L	H	M	L	L	M	L	L	M
	Safety	L	L	L	L	L	L	L	M	M

Key
H High Impact
M Medium Impact
L Low Impact

5.2.3 DRC

IUU Level >		Unknown - likely High				Unknown - Likely High				Unknown - Likely Medium	
Impacts		Offshore - Large Pelagics				Inshore - Prawn & Shrimp				Coastal - Artisanal	
		Fishing without a license	Miss/under reporting	Other: Trans-shipping	Fishing in closed area/time	Fishing without a license	Miss/under reporting	Other: Trans-shipping	Fishing in closed area/time	Fishing without a license	Miss/under reporting
Economic	Direct loss of revenue	M	L	L	L	H	H	M	M	M	M
	Indirect loss of revenue	M	M	M	M	H	H	H	H	M	M
	Downstream loss of revenue	L	L	L	L	H	H	H	L	L	L
Ecosystem	Target stock status	M	M	M	M	H	H	H	H	H	H
	Overlap stock status	M	M	M	M	M	M	M	M	M	M
Social	Food security	L	L	L	L	H	H	H	H	H	H
	Fisher conflicts	L	L	L	L	H	H	H	H	H	H
	Safety	L	L	L	L	L	L	L	L	L	L

5.2.4 Madagascar

IUU Level >		Medium			Medium				Medium		Medium		
Impacts		Offshore - DWFN pelagic			Coastal - artisanal				Coastal - industrial prawn		Coastal - semi-industrial		
		Fishing without a license	Fishing prohibited species	Miss/under reporting	Fishing prohibited species	Miss/under reporting	Fishing with prohibited gear	Fishing in closed area/time	Fishing in closed area/time	Fishing with prohibited gear	Fishing prohibited species	Fishing with prohibited gear	Fishing in closed area/time
Economic	Direct loss of revenue	L	L	L	L	L	L	L	L	L	L	L	L
	Indirect loss of revenue	L	L	L	L	L	L	L	L	L	L	L	L
	Downstream loss of revenue	L	L	L	L	L	L	L	L	L	L	L	L
Ecosystem	Target stock status	L	L	L	H	H	H	H	H	H	H	H	H
	Overlap stock status	M	M	M	M	M	M	M	H	H	M	M	M
Social	Food security	L	L	L	M	M	M	M	M	M	M	M	M
	Fisher conflicts	L	L	L	L	L	L	L	M	M	L	L	L
	Safety	L	L	L	L	L	L	L	L	L	L	L	L

5.2.5 *Mauritius*

IUU Level >		High			Medium					Low		Low		
Impacts		Offshore - pelagic			Offshore - bank fishery					Coastal - FAD		Coastal - lagoonal		
		Fishing without a license	Fishing prohibited species	Miss/under reporting	Fishing without a license	Fishing prohibited species	Miss/under reporting	Other: Trans-shipping	Fishing in closed area/time	Miss/under reporting	Fishing in closed area/time	Fishing prohibited species	Miss/under reporting	Fishing in closed area/time
Economic	Direct loss of revenue	L	L	L	L	L	L	L	L	L	L	L	L	L
	Indirect loss of revenue	L	L	L	M	M	M	M	M	L	L	L	L	L
	Downstream loss of revenue	L	L	L	L	L	L	L	L	L	L	L	L	L
Ecosystem	Target stock status	L	L	L	H	H	H	H	H	L	L	H	H	H
	Overlap stock status	M	M	M	M	M	M	M	M	L	L	M	M	M
Social	Food security	L	L	L	L	L	L	L	L	M	M	M	M	M
	Fisher conflicts	L	L	L	L	L	L	L	L	M	M	L	L	L
	Safety	L	L	L	L	L	L	L	L	M	M	L	L	L

5.2.6 Namibia

IUU Level >		Low			Medium			Low			Low		
Impacts		Offshore - Large Pelagics			Offshore & Inshore - Demersal			Inshore & Shelf Edge - Horse Mackerel			Offshore & Coastal - Crustacean		
		Fishing without a license	Fishing prohibited species	Miss/under reporting	Fishing prohibited species	Miss/under reporting	Fishing in closed area/time	Fishing prohibited species	Miss/under reporting	Fishing in closed area/time	Fishing without a license	Miss/under reporting	Fishing in closed area/time
Economic	Direct loss of revenue	L	L	L	L	L	L	L	L	L	L	L	L
	Indirect loss of revenue	L	L	L	M	M	M	M	M	M	M	M	M
	Downstream loss of revenue	L	L	L	L	L	L	L	L	L	L	L	L
Ecosystem	Target stock status	L	L	L	L	M	M	M	M	M	M	M	M
	Overlap stock status	M	M	M	M	M	L	M	M	L	M	M	M
Social	Food security	L	L	L	L	L	L	L	L	L	L	L	L
	Fisher conflicts	L	L	L	L	L	L	L	L	L	L	L	L
	Safety	L	L	L	L	L	L	L	L	L	L	L	L

5.2.7 South Africa

IUU Level >		Low			Medium			Low			High			Low		
Impacts		Offshore - Large Pelagics			Offshore & Inshore - Demersal			Inshore - Small Pelagics			Coastal - Sedentary			Offshore & Coastal - Crustacean		
		Fishing without a license	Fishing prohibited species	Miss/under reporting	Fishing prohibited species	Miss/under reporting	Fishing in closed area/time	Fishing prohibited species	Miss/under reporting	Fishing in closed area/time	Fishing without a license	Fishing prohibited species	Fishing in closed area/time	Fishing without a license	Miss/under reporting	Fishing in closed area/time
Economic	Direct loss of revenue	L	L	L	L	L	L	L	L	L	H	H	H	L	L	L
	Indirect loss of revenue	L	L	L	M	M	M	M	M	M	H	H	H	M	M	M
	Downstream loss of revenue	L	L	L	L	L	L	L	L	L	H	H	H	L	L	L
Ecosystem	Target stock status	L	L	L	L	M	M	M	M	M	H	H	H	H	H	H
	Overlap stock status	M	M	M	M	M	L	M	M	L	M	M	M	M	M	M
Social	Food security	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Fisher conflicts	L	L	L	L	L	L	L	L	L	M	L	L	L	L	L
	Safety	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L

5.2.8 Tanzania

IUU Level >		Medium				Medium		Low		
Impacts		Coastal - artisanal				Coastal - prawn		Offshore - DWFN pelagic		
		Fishing prohibited species	Miss/under reporting	Fishing with prohibited gear	Fishing in closed area/time	Fishing in closed area/time	Miss/under reporting	Fishing without a license	Fishing prohibited species	Miss/under reporting
Economic	Direct loss of revenue	L	L	L	L	L	L	L	L	L
	Indirect loss of revenue	L	L	L	L	L	L	L	L	L
	Downstream loss of revenue	L	L	L	L	L	L	L	L	L
Ecosystem	Target stock status	H	H	H	H	H	H	L	L	L
	Overlap stock status	M	M	M	M	H	H	M	M	M
Social	Food security	M	M	M	M	M	M	L	L	L
	Fisher conflicts	L	L	L	L	M	M	L	L	L
	Safety	L	L	L	L	L	L	L	L	L

6 Case Studies on IUU

6.1 Sharks in peril

In December 2002, 37 beheaded turtles were reportedly washed up on beaches in Bazaruto Archipelago National Park[32]. It was suspected that they had been cut from longline hooks of IUU vessels targeting sharks, close inshore and often within the National Park. Further reports by WWF[33] in January 2003 indicated that 40 turtles, either beheaded or with their throats cut, had washed up on beaches in the same area. These incidents were apparently not isolated as IUU longliners were often sighted in other coastal areas as well. After months of negotiations the Mozambican government sent a group of Marine soldiers to the Bazaruto National Park and in May 2003, with the help of the ski boats of a resort hotel, one of the IUU longliners was apprehended while fishing inside the protected area. After initially ignoring repeated radio calls the vessel attempted to flee. Volleys of gunfire by the Marines were returned by the crew of the IUU vessel, indicating that they were armed and not planning to stop. As a last resort the Marines launched a rocket-propelled grenade, which damaged the fly bridge of the vessel. No injuries were reported, but the vessel had to be towed to port.

In March 2004, the South African patrol vessel *Eagle Star*, in a joint operation with Mozambican authorities, arrested two foreign fishing vessels off the coast of the central province of Sofala for illegal fishing. The first vessel, the Indonesian registered *MFV Sin Iu Peng* disobeyed repeated requests from the Mozambican fisheries officials to stop for boarding and inspection. A RIB was launched from the *Eagle Star* with an armed contingent of South African and Mozambican fisheries officers onboard, and after some resistance from the fleeing vessel, a stun grenade was thrown onboard to ensure access for the fisheries officers. Many kilometres of small mesh gillnets were found onboard despite the vessel only having a license from Mozambican authorities to fish with a purse seine net. The catch consisted mostly of King Mackerel and the hold was estimated to be approximately 60 - 70 % full. Another suspected IUU vessel, the Chinese flagged, *MFV Nong Jyl Lih*, was also detected in the vicinity. The vessel altered course and attempted to flee, while requests to stand by for boarding and inspection were ignored. Two stun grenades were thrown at the deck, but the vessel kept steaming and made no attempt to communicate with the *Eagle Star*. One of the South African inspectors then jumped from the RIB onto the stern of the vessel and tied a rope ladder to the stern. Three more inspectors followed, who then succeeded in stopping the vessel, which was also licensed to fish in Mozambican waters with a purse seine net. The fishing gear found onboard consisted of large mesh bottom gillnets with a frozen catch of sharks, shark fins and 20-30 tons of giant guitarfish, a species regarded as 'vulnerable'. The owners of the two vessels were fined 16 billion meticais (about US$ 667 000), and their illicit catch was confiscated. The confiscated fish from both vessels, was valued at about US$ 300 000 and the forfeited vessels were valued at more than US$ 1 million each.

In 2006 the Chinese flagged longliner, *Da Yuen Yu 309*, was arrested by Mozambican authorities for fishing without a license and fined US$ 400,000. The owners were unwilling or unable to pay the fine. According to a report in Fishing News International (June 2006) the vessel was removed from the Chinese register in 2005. Current records indicate that the vessel is authorised to fish in the Western and Central Pacific Fisheries Commission (WCPFC) under the Chinese flag.

In September 2006 it was reported that the Japanese registered longliner, the *Ryoei Maro*, was damaged in a collision with a Thai vessel, *Tengone BH3102*, off the coast of the Angoche district, in the northern Mozambican province of Nampula, and sank. Mozambican authorities launched a rescue operation to transfer the 22 crew members of the *Ryoei Maru* (seven

[32] *At Loggerheads*: reported by Carte Blanche, a South African documentary program, on 6 July 2007.
[33] *Beheaded turtles washing ashore in Mozambique*, WWF Mozambique Programme Office, 29 January 2003.

Japanese and 15 Indonesians), who had been transferred to the Thai ship after the collision. It was reported that prior to the collision, Mozambican authorities were not aware of either of the vessels within the Mozambican EEZ.

NGOs are adamant that there are several vessels illegally fish for sharks on the edge of the continental shelf. The NGOs fear that this has now spilled over to the artisanal sector too, with reports of "Chinese" buying up shark fins from artisanal fisheries on a regular basis, stimulating further exploitation of sharks in the inshore area. There are also reports of IUU gillnetting and longliners operating with impunity; estimates place 100 IUU longline / gillnet vessels in the Mozambican channel. The fact that Mozambique has only a limited patrol boat capacity, lack a sea-going Navy and has limited or no aerial surveillance, makes it difficult to estimate the true extent of IUU fishing.

6.2 Rock lobster magnate behind bars

Hout Bay Fishing Industries, one of the right holders in the South African south coast rock lobster fishery, was successfully prosecuted in 2002 on 28 charges of contravening the Marine Living Resources Act, admitting that between 1999 and 2001 the company knowingly and intentionally participated in the over-fishing of south coast rock lobster, west coast rock lobster and hake. A director of the company, Colin van Schalkwyk, pleaded guilty to 301 charges of corruption, by bribing fisheries inspectors. In 2004, Arnold Maurice Bengis, former head of the company and two other defendants were found guilty in the US to charges of conspiracy and smuggling and importing wildlife caught in violation of foreign or state laws, under the Lacey Act. They received prison sentences, ranging from one to four years, and fines of about $7.5 million for importing rock lobster and Patagonian toothfish, in contravention of South African and international law, in an elaborate poaching and smuggling operation over several years. In a ruling in the US District Court in May 2007 it was recommended that Bengis and his co-defendants did not have to pay compensation of more than R567 million ($41 million) to the South African government as restitution for the overfishing of the south coast rock lobster stocks. The amount was based on a study commissioned by the government, which estimated that this was the economic loss due to Hout Bay Fishing's activities.

Impacts on stock assessments and management
A forensic investigation showed that the over-catch made by Hout Bay Fishing was 114 tons (tail mass) in 1998/99 (an over-catch of 142.3%), 135t in 1999/2000 (+189.6%), and 58.4t (+83.5%) in 2000/2001. A comparison of lobster catch rates reported by Hout Bay Fishing with those of the rest of the lobster fishing fleet showed, remarkably, that from virtual parity with the rest of the fleet in 1997/98, their reported catch rates decreased to 39% of the average of their competitors over four years (Figure 6). The simplest explanation for this is that catches were increasingly under-reported, but not fishing effort. Over the same period, fluctuations in the catch rates of the rest of the fleet were minimal.

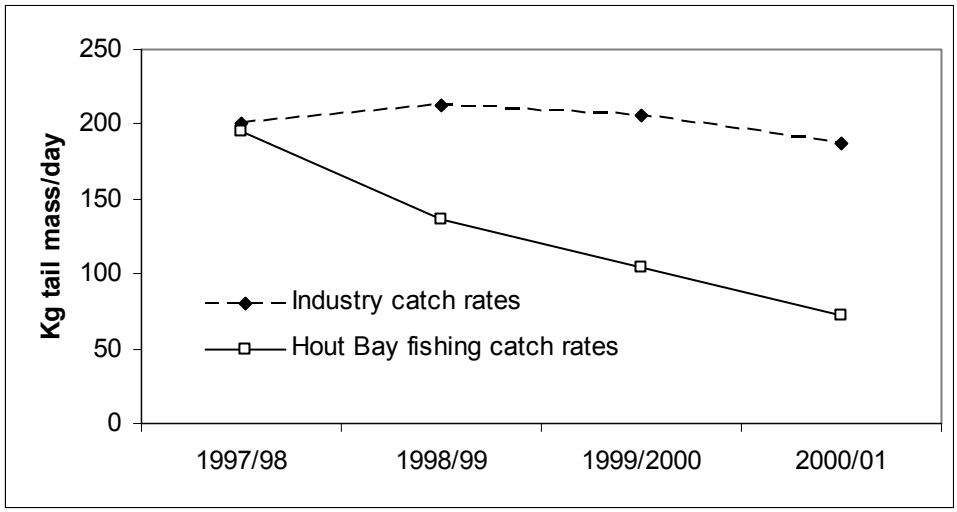


Figure 6 The decrease in the reported catch rates of Hout Bay Fishing compared to their competitors from 1997/98 to 2000/1 (from Groeneveld, 2003).

The 'total catch' and catch-per-unit-effort (CPUE) data of the south coast rock lobster fishing fleet are used in annual stock assessments to determine the Total Allowable Catch (TAC) for the following year. To determine how the misreported information affected stock assessments, a review of the data and models was undertaken shortly after the Hout Bay Fishing facts became known (Groeneveld, 2003). A recalculated CPUE index for the fleet (but excluding the misreported data) showed an increase of 2% for 1998/99, 12% for 1999/2000 and 14% for 2000/01 (Figure 7).

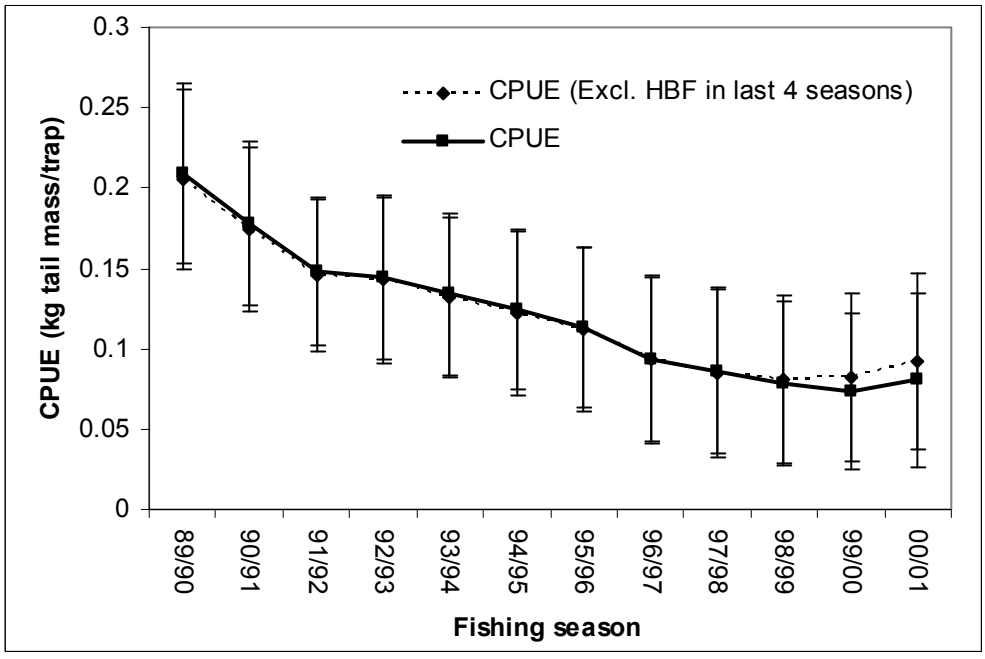


Figure 7 The recalculated CPUE index for the fleet (excluding the misreported data by Hout Bay Fishing) showed a gradual increase to 14% for 2000/01 (from Groeneveld, 2003).

Using the recalculated CPUE index together with the corrected 'total catches' (reported plus unreported catches) in an age-structured production model increased the estimated maximum sustainable yield of the resource from 360 t/tail mass to 390 t in 2002.

A shift in management strategy from a solely TAC-managed fishery to one based on a TAC and total allowable effort (TAE) to prevent overfishing was instigated in 2001. This strategy, combined with an effort reduction through the removal of Hout Bay Fishing's vessels from the fishery (their rights were revoked in 2002) led to a strong recovery of the south coast lobster stock between 2001 and 2006 (Figure 8). The combined TAC and TAE management strategy is now entrenched and strict guidelines have been set for the entry of new vessels into the fishery.

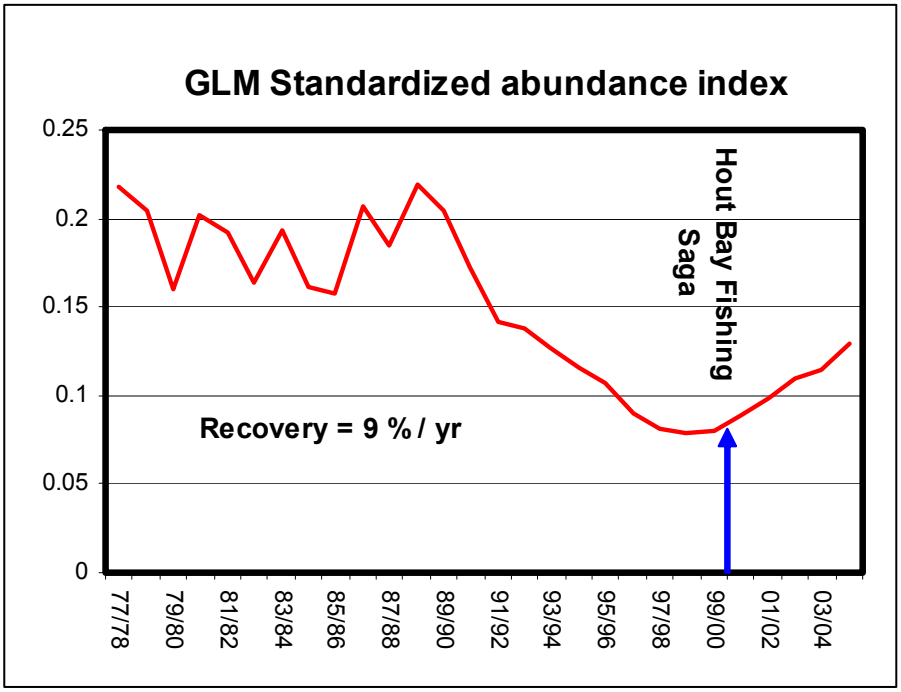


Figure 8 Recovery in the South Coast rock lobster stock after the Hout Bay Fishing saga).

6.3 Tristan rock lobster – using genetic profiles to catch pirates

The rock lobster *Jasus tristani* occurs in the southern Atlantic Ocean, with populations restricted to the Tristan da Cunha Archipelago (4 islands), Gough Island (400 km to the southeast) and Vema Seamount, roughly 2000 km northwest of Tristan. The Tristan archipelago and Gough Island are UK territories, and Ovenstone Agencies (Cape Town) has exclusive rights to land lobster caught in these waters, which are managed by the Islanders. Vema Seamount is in international waters.

The Tristan fishery has a long history of IUU fishing activity, going back several decades, and vessels that land lobster catches in Cape Town often declare that they have been caught legally at Vema Seamount. These declarations need to be questioned, because intensive commercial exploitation at Vema in the 1960's depleted the lobster resource there severely. Ovenstone's vessels regularly visit Vema, and they report very low catch rates, confirming that the Vema stock has not yet recovered.

Apart from the legal catches from Tristan and Gough Islands by Ovenstone's, at least four foreign flagged vessels regularly land *Jasus tristani* in Cape Town, and based on their applications to land lobsters, the tonnage appears to be increasing over the years (Table 1).

Table 1 Catches of Tristan lobsters landed in Cape Town harbour from 2000 to 2006.

Vessel	*Jade*	*Espadarte*	*Avo Musico*	*Avo Rato*	Total (tonnes)
Flag	Portugal	Togo	Portugal	Portugal	
2000	15				**15**
2001	48.3				**48.3**
2002	61				**61**
2003	32	7			**39**
2004	27	20		4	**51**
2005	31	35	12		**78**
2006	30.6		8		**38.6**
Total (tonnes)	**244.9**	**62**	**20**	**4**	**330.9**

VMS tracks show that the *Espadarte* fished at Vema Seamount *en route* to Tristan da Cunha and Gough Islands, where it spent most of its time (Figure 9 & Figure 10). During some of the trips inside the Tristan da Cunha EEZ the vessel had a licence to fish for finfish with a longline. Another vessel, the *Jade* had an experimental licence to fish for octopus on the seamounts around Tristan, but a high bycatch of lobsters during these trips was suspected. The vessels have been observed to carry lobster traps, and the landings reported from these trips include bluenose, octopus (*Octopus vulgaris*) and lobster.

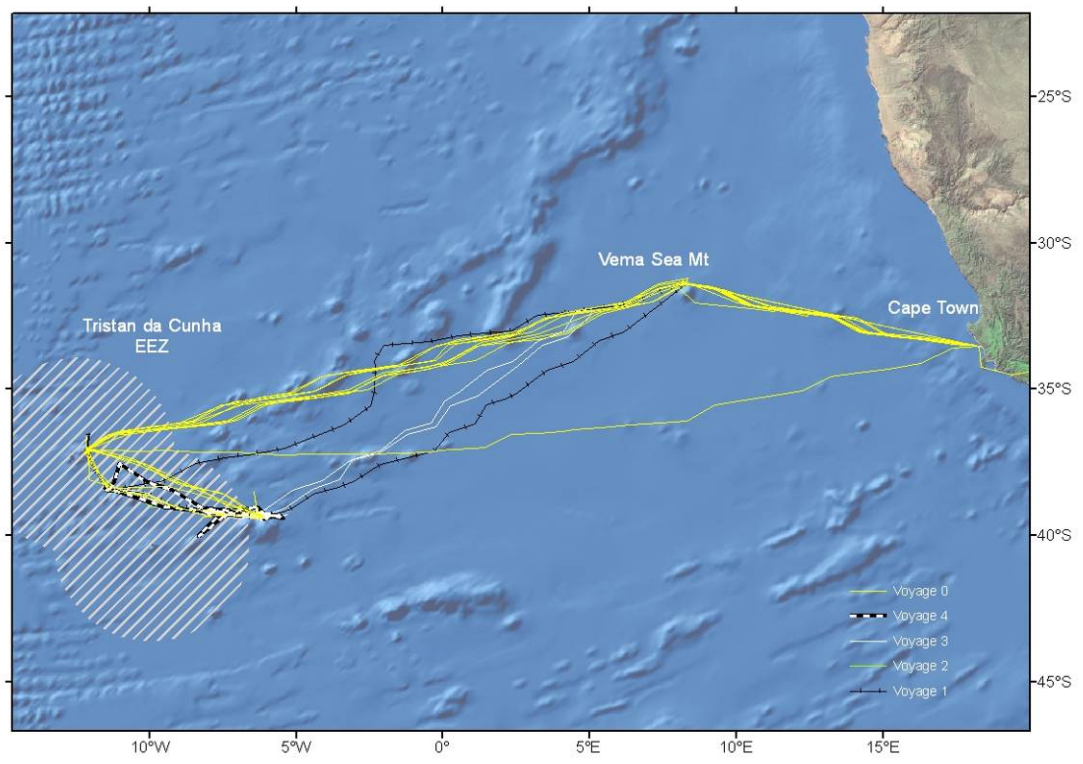


Figure 9 The VMS tracks of the *Espadarte* between November 2004 and August 2006.

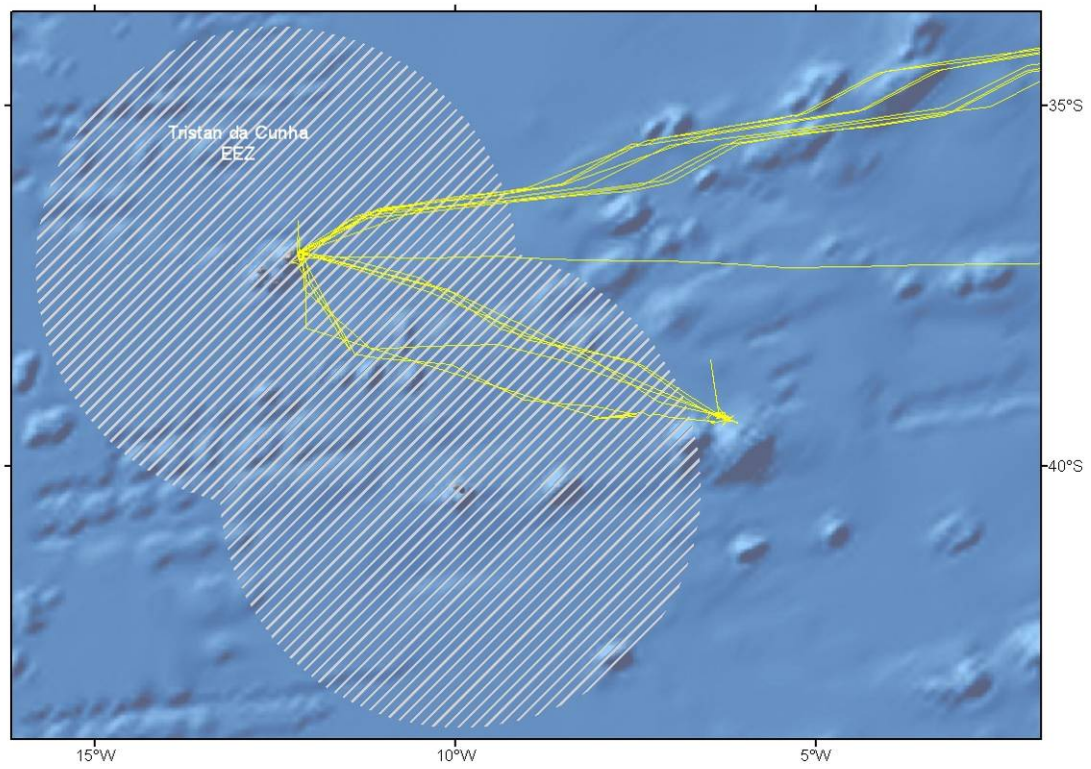


Figure 10 The VMS tracks of the *Espadarte*, showing the vessel entering the Tristan EEZ during periods when it did not have a license to fish inside the economic zone.

Cross-referencing port entry records with applications for gear permits, (which is a prerequisite for any foreign flagged vessel to enter a South African port), and invoices of catches between January 2005 and January 2007 showed that the *Jade* entered Cape Town harbour without applying for a gear permit 3 times. Invoices from the *Jade* for 14th February 2005, after the vessel entered port without a gear permit on the 9th, show lobster sales of 5064 kg. On 27th July 2005, another date on which the *Jade* entered without a gear permit, it landed 4000.5 kg of lobster. These large quantities are very unlikely to have come from Vema Seamount, and based on the VMS records, sightings by islanders and other vessels, it most likely consists of illegal catches made at the Tristan archipelago, and particularly at Gough Island. A CPUE series furthermore suggests that more lobster is caught at Gough Island than can be explained by legal catches alone.

Cooperation between the Tristan Government, the South Africa's Marine and Coastal Management (MCM), and Ovenstone's to deter illegal catches of *Jasus tristani* led to attempts to establish the origin of some of the catches through genetic profiling, to establish whether it was caught on Vema, as claimed, or illegally within Tristan's EEZ. Although there are genetic differences between the lobster populations at Vema and Tristan, results were inconclusive (Von der Heyden et al., 2007). Studies are continuing, and it is likely that the authorities will soon be able to verify and prove the origin of *Jasus tristani* from their mitochondrial DNA. Other initiatives to deter IUU fishing on this resource include the monitoring of landings in South African ports, the use of fishing vessels for surveillance, skippers as honorary Fisheries Inspectors, *ad hoc* visits by the Royal Navy, and development of ordinances that will allow for prosecution of IUU operators apprehended in Tristan waters.

6.4 Small Pelagics Fraud

An apparent trophic shift in the Agulhas / Benguela current interface has affected the distribution of sardines in the waters around South Africa, and since 2000 a higher concentration of stocks occur along the Cape South Coast, near Mossel Bay. As a consequence, the fishing fleet of purse seiners, traditionally based on the West Coast, some 500km to the west of Mossel Bay, started fishing on the South Coast. The industry soon approached MCM to request permission to land the fish in Mossel Bay, and then truck it from there to the factories on the West Coast. The alternative would be that the vessels spend 4 days in transit between the fishing grounds and the factories, leading to deterioration in the quality of the fish.

The Department agreed and put in place a monitoring scheme, whereby the quantity of fish offloaded per boat was recorded in Mossel Bay and then reconciled with the factory catch returns submitted to the Department. In 2002, reports were being received that this system was being abused and undermined by some role players in the small pelagic industry. The Department launched an investigation in 2003, and a joint operation was initiated between members of the Department of Justice: Directorate of Special Operation ("the Scorpions") and members of the Specialized Unit of Marine and Coastal Management, on corruption in the small pelagic fishery (sardines) in Mossel Bay. After an undercover operation of more than six months, and the subsequent investigation, it was determined that many of the catches of the small pelagic fleet based in Mossel Bay went unreported, or were at the very least were underreported. There were two aspects to the misreporting incidents, which involved 21 rights holders and pelagic processing establishments.

Firstly, the fishing vessels generally had holds in excess of 20t, which was the upper limit of the trucks transporting the fish to the processing plants on the West Coast. Therefore some fish always remained behind after the truck was filled. This excess fish was then sold to a local small processing company that was not a part of the fishing company that caught the fish. Generally 1-5t of fish remained onboard the fishing boat, which was not declared on the landing sheet, and remained unmonitored. The shore-based monitors only recorded the portion of the fish that was loaded into the trucks. Once the monitor had left, the rest of the fish was offloaded and taken to the local processor(s) in Mossel Bay. This was made possible by the involvement of bribed MCM's Fisheries Inspectors and the alleged involvement of the coordinators of the shore-based monitors in Mossel Bay.

In August 2005, in the first test case, Profish Mossel Bay was sentenced to a fine of R350 000 (US$ 54 000) and its director received a 5 year suspended sentence after being convicted for fraud involving illegal fishing. The investigation against the other fishing companies, skippers, a MCM inspector (since retired) and several fisheries monitors, on contract to MCM to oversee the landing of catches in the harbour, is still ongoing. It is estimated that about 3 000 tons of sardines was involved over a three year period, from April 2001 to March 2004.

The second scheme allegedly involved some of the fishing vessels landing their catches to coincide with periods when there were no shore-based monitors available. The quantity of fish delivered to the factories were then unreported, in that the factory did not report the fish delivery on their factory catch return to MCM, or they underreported the quantity of fish, for example, that the truck only delivered 16t, instead of the 20t they actually landed. The investigation against these fishing companies, skippers, and crew is still ongoing. It is estimated that 220 truck loads, of about 20t of fish each, (± 4 500t of sardines) was involved in this scheme over a

three period, from April 2001 to March 2004. The estimated retail value of this fish was R 18 million (US$ 2.4 million).

It is estimated that the catches involved in the fraudulent under and misreporting of catches in Mossel Bay represented about 1.1% of the TAC during the 2001-2004 period (Table 2).

Table 2 The quantities of sardines allegedly involved in the fraudulent underreported or misreporting of catches in Mossel Bay. The Total Allowable Catch (TAC) for sardines, as set by the management authority, for the years when the alleged fraudulent activities took place is shown.

Year	Sardine TAC (tons)	Estimated IUU catches (tons)	IUU catches as % of TAC (tons)
2001	10 111 *		
2002	257 000		
2003	280 000		
2004	152 333 **		
Total	**699 444**	**7500**	**1.1%**

* Taken as a proportion of the TAC for 2001 of 182 000 t for the period April to December when the offences were allegedly committed
** Taken as a proportion of the TAC for 2004 of 457 000 t for the period January to March when the offences were allegedly committed

6.5 A Low-cost Regional information sharing tool to combat IUU

A relatively low-cost source of valuable information is an integrated database with information on port entries of fishing vessels in the region. This gives authorities a chance to keep track of the movements of vessels that are suspected to be involved in IUU activities as well as monitor all vessels that are actually active in the region. If the database is linked to a list with the names and particulars of vessels, which have been 'blacklisted' by RFMO's or which appear on 'black lists' distributed by governments and NGO's, it would give authorities an opportunity to conduct port inspections and implement sanctions where appropriate.

Some of the information on port entries already exists in the public domain through website such as *www.ports.co.za*, which has information on vessels entering the ports of a number of Southern African and Indian Ocean Island states. Another website, *www.tanzaniaports.com*, of the Tanzanian Ports Authority, maintains an updated shipping list for the ports of Dar es Salaam, Tanga and Mtwara. Although the information on this site pertains mostly to the merchant fleet there is some information on the movements of fishing vessels. Similar information can be found on the websites of the Namibian Port Authority for Walvis Bay and Lüderitz (*www.namport.com*) and the Mauritius Port Authority (*www.mauport.com*).

Cooperation with port authorities, vessel agents and other sources could ensure that the data is crosschecked and further expanded. RFMO's such as ICCAT, IOTC and SEAFO already have authorised lists of vessels to fish in the convention area. Similar records exist for refrigerated cargo vessels, which are permitted to be involved in at-sea transhipments. All of this information could be imported into the database, updated on a daily basis and circulated to authorities in the different countries.

By integrating information from different sources, the current study has developed a database, containing 15373 records, of vessels visiting the ports of Walvis Bay, Cape Town, Port Elizabeth, Durban, Maputo, Beira, Nacala, Dar es Salam and Port Louis. The capturing of information in a database enables the crosschecking of port entries by 'black listed' or vessels suspected of IUU activity, and could, if further developed, be used as a relatively low-cost port control measure or as a tool indicating vessel movements.

Since the beginning of 2004, 71 of the port entries recorded in the experimental database (with real data) were of vessels that have been 'black listed' by RFMO's such as CCAMLR, ICCAT, IOTC, NEAFC and /or NAFO. Regional cooperation in information sharing would be an important first step in developing such a tool. The development and maintenance of such a database could be outsourced to a private company at relatively low cost.

7 Action areas

1. **Create the diplomatic environment and increase the capacity of the states to exchange information on IUU fishing**

   For efficient data sharing to exist (including VMS data) in the SADC region current data standards, data holding capabilities and data confidentiality policies must be adapted and a coordinated approach to MCS information exchange developed.

2. **Harmonise and improve the legal frameworks towards IUU fishing in the SADC region**

   Existing domestic legislation needs to be strengthened to ensure that the national legislation of each coastal state contains the provisions that facilitate effective enforcement both during the inspection process and during the legal process. The effectiveness of SADC MCS systems in fighting IUU and in ensuring compliance with laws and RFMO obligations will depend very heavily on whether or not domestic laws provide appropriate mechanisms to facilitate this task. This may need to be supported and will need to be implemented in collaboration with the RFMO and a structured step by step plan assisting them to meet these challenges.

   The development and implementation of NPOA's IUU by SADC Members should be a priority. This could form the basis from which countries can take stock of what their responsibilities are and to find cost effective ways to implement these responsibilities. By implementing many of the elements of the IPOA IUU at national level (through an NPOA) countries will be helped to tackle many of the inefficiencies caused by a lack of good governance and transparency.

3. **Implement training in port inspection and regional collaboration on standards**

   The strengthening of port state controls is now generally accepted as one of the strongest tools to fight IUU. A number of SADC port states already exercise good levels of control over foreign fishing vessels voluntarily in their ports. Experience of the way in which IUU fleets operate strongly suggests the need for a network of mandatory port state controls and a regional approach to implementation, accompanied by harmonised training in port inspection. In exercising their duties,

port state inspectors must be properly qualified and authorised by the port state authority to carry out port state inspections. Minimum standards for port state inspectors should be devised and agreed upon. In order to achieve the qualifications required adequate training courses should be elaborated and maintained in collaboration with the relevant RFMOs as well as other regional initiatives (e.g. IOC-MCS programme inspection training programmes). The FAO Model Scheme also contains detailed inspections procedures and these should be reflected and included where appropriate in training materials.

4. **Establish either a new Regional Vessel Record[34] or associate with the Indian Ocean Commission concerning the record being developed by the IOC-MCS Programme.**

   There is no legal obstacle that would prevent the establishment of a SADC Regional Record of fishing vessels, as mandated by the SADC Protocol and especially, Article 8(4)(d)35. When the initial call for the establishment of such a Regional Record was made it was considered to be a new, innovative approach. However, since then similar initiatives are being considered by a number of RFMO's and other bodies in the region, which would undoubtedly lead to a duplication of effort. Therefore, such an initiative should not only be looked at under the limited scope of SADC, but rather be part of these other initiatives in the region. As a start SADC members should ensure that they are capable of keeping a reliable list of vessels at national level with information relating both to their own national vessels and to foreign fishing vessels, which are licensed to fish in their waters or which make port calls only.

   The information contained in the Record should help the participating SADC States to comply with all their obligations and undertakings under multilateral and regional international instruments, e.g. information on 'black listed' vessels should be included. The implementation and use of the Record could be phased in, for example, initially using it as a means of sharing information and then once the functionality has been proved to be working well, it can be used in enforcement actions. A Regional Record will only function as an effective MCS tool where all the relevant role players are in agreement as to the requirements for access, all parties participate in enforcement measures and the consequences of non-compliance are similar and transparent.

5. **Experiment with new technology to improve the regional cost effectiveness of sea going patrols**

   While appreciating the requirement for an offshore 'deterrent' for illegal activities and to control the non-reporting and misreporting issues, offshore patrolling is an extremely expensive activity and may not always be possible in the SADC region. In this respect there is a need to differentiate the requirement for 'deterrent' and 'detection'. There will always be a requirement to maintain a 'deterrent presence' at sea to prevent any future interest from suspecting IUU activity and to apprehend vessels undertaking IUU fishing. The requirement for 'detection' is needed to cost effectively monitor if a problem exists (preferably by air or satellite), so a decision can then be made to deploy sea-going assets to confront the problem. This is needed to increase the cost effectiveness of the already scarce sea going assets in the region. The means for detection should be able to

[34] Many of the recommendations taken from: SADC MCS Programme, 2004. The Legal Implications of Establishing a SADC Regional Fishing Vessel Record. Working Paper No. 21.
[35] This was the position in 2004 when the SADC MCS Programme study was commissioned.

identify targets over as large an area as possible for the lowest cost and provide a mechanism to target the patrol resources as efficiently as possible.

There has been considerable research carried out by the IOC MCS Pilot Project in the region in collaboration with the European Space Agency in the use of satellite remote sensing for detecting IUU vessels, which can provide a relatively cheap detection of suspect targets so offshore inspection can be targeted more effectively. This is extremely important for those states that have immense EEZs and are subject to migratory fish stocks and dispersed fleets.

6. Implement IUU assessments to improve the estimates of regional IUU by sector

One of the specific objectives of the IOC-MCS Pilot Project is to obtain quantitative estimates of IUU fishing within the EEZs of Indian Ocean Commission. One of the methods adopted is the use of satellite Synthetic Aperture Radar (SAR) from the European Space Agency's ENVISAT satellite in association with overlaid VMS data, on the assumption that IUU vessels will not be associated with VMS records.

The JRC has now recently started working on a new EC financed TANGO project looking to develop an operational real-time application for SAR imagery. The French CROSS (MCS Management Agency based in La Réunion) have been using SAR imagery for the control of IUU fishing in the "Terres Australes" particularly Kerguelen over toothfish.

New complimentary assessments would be incredibly useful in the SADC region and form part of a common approach in this field.

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8 Annexes

8.1 Management Questionnaire on Illegal, Unreported and Unregulated (IUU) fishing for fisheries managers

Background to the study

Illegal, Unreported and Unregulated (IUU) fishing is a pressing global issue with significant environmental, economic and social impacts. Developing countries often bear the greatest losses, making it a high priority issue in our region.

This survey forms part of a study commissioned by the Southern African Development Community (SADC), which aims to increase the understanding of IUU fishing in the Southern African countries of Angola, DRC, Madagascar, Mauritius, Mozambique, Namibia, South Africa and Tanzania.

The study will explore and help to quantify the magnitude and types of IUU fishing in the region as well as the economic, socio-economic, nutritional and biological impacts at both the national and regional level. The outputs and main findings will be presented at a ministerial conference in May of this year.

All your responses will remain anonymous.

Many thanks for your help and support.

Please send completed questionnaires by the 7th April 2008:

Part A

Please complete the following table, indicating the number of infractions within each fishery and time period. Also, indicate the impact of these infractions. We have pre-identified some of the key fisheries within your country, however please add any others we have omitted.

The codes to be used for the offence types as well as the Frequency of the Offence are indicated below. Please also see note under the frequency of offence box.

Offence types are as follows:	**Frequency of offence - Use the following numbering:**
1 = Fishing without a valid licence (please indicate the value of a licence, and if possible an estimate of catches made by unlicensed vessels) 2 = Fishing with unauthorised gear/techniques (please indicate the permitted gear types and the illegal types used) 3 = Fishing in closed/restricted areas or times (please indicate restricted areas or times) 4 = Catching/landing of prohibited species (please indicate which species) 5 = Mis/under-reporting of authorised species (please indicate how much 6 = VMS mis/non-reporting 7 = Other – please give details	1. A common offence which occurs often (around 100+ cases per year) 2. A relative frequent offence (around 20-100 cases per year) 3. An offence which does not happen often (around 5-20 cases per year 4. An offence which rarely occurs (maybe 0-5 cases per year) 5. An offence that never occurs (0 cases per year) Note. *Where data is not known or not collected, please indicate a score from 1-5 in each of the boxes in the same way - 1 being the highest and 5 being the lowest indicating your perceived gravity of each of these offences in each fishery and within each fleet sector etc. Where this is the case please indicate a (P) next to the figure in each box.*

Fishery	Offence type	Frequency of offence				Impacts of the illegal activity (consider impacts on stocks, costs and benefits, impacts on who (e.g. on small-scale fishers) Please also estimate the scale of the offences each year, e.g. volume of fish taken illegally, value of fish taken illegally,
		Pre 1990	1990-2000	2000-2005	2005-present	
Fishery 1	1 Fishing w/out licence					
	2 Fishing w/ unauth. gear					
	3 Fishing in closed area/time					
	4 Fishing prohibited sp					
	5 Misreporting					
	6 VMS misreporting					
	7 Other					
Fishery 2 etc..	1 Fishing w/out licence					
	2 Fishing w/ unauth. gear					
	3 Fishing in closed area/time					
	4 Fishing prohibited sp					
	5 Misreporting					
	6 VMS misreporting					
	7 Other					

Part B – Please answer every question. If you need more space please use a separate piece of paper clearly indicating the question it refers to.

Question	Yes / No	Details
1. Has there been a legal review of your regulations and acts for fighting IUU fishing activities or is one being carried out?		
2. Do you think the national laws and regulations in your state are sufficient to control IUU?		
3. Are you a member of a regional RFMO(s)? If so, please specify which ones and since when?		
4. Have/are RFMO resolutions being integrated into national law, if so in what frequency?		
5. Is it an offence for your state's nationals to violate fishery laws of other states or that of the RFMO?		
6. Does your state have means to ensure your flag vessels do not undermine high seas fishery conservation and management measures		

Question	Yes / No	Details
7. Are you able to prosecute a foreign fishing vessel in an area under your waters if the fish has been taken outside your EEZ in contravention of conversation measures?		
8. Does your state verify that a vessel visiting your port has received authorization from its flag state to fish in areas beyond the flag state's jurisdiction and that the information collected is in line with the FAO port inspection guidelines?		
9. Is registration required for all fishing vessels (national and foreign) when they are flagged in your country?		
10. Is there a policy or practice to avoid registering/licensing vessels with a history of IUU fishing?		
11. Has your state cooperated under the auspices of a regional organization to develop and implement internationally agreed market-related measures to combat IUU fishing?		

Question	Yes / No	Details
12. Are there regulations concerning the prevention in the trade or importation of IUU caught fish?		
13. Are your inspectors given all the powers needed to fight IUU fishing in port and at sea		
14. Are all your flagged vessels that fish *within* areas of national jurisdiction required to have express authorization to fish		
15. Are all your flagged vessels that fish *beyond* areas of national jurisdiction required to have express authorization (including licenses for high seas fishing)?		
16. Have measures been taken to improve MCS capacity?. If yes, please explain.		
17. Does your state have the means to control the fishing activities of the vessels registered in your state (e.g. VMS)?, if not what capacity issue is at fault (human, budgetary, assets? Etc.)		

Question	Yes / No	Details
18. Does your state have the means to control the fishing activities of the vessels licensed to fish in your state		

FAO Definition of **IUU** Fishing: **Illegal** fishing refers to activities: (1) conducted by national or foreign vessels in waters under the jurisdiction of a State, without the permission of that State, or in contravention of its laws and regulations; (2) conducted by vessels flying the flag of States that are parties to a relevant regional fisheries management organisation but operate in contravention of the conservation and management measures adopted by that organisation and by which the States are bound, or relevant provisions of the applicable international law; or (3) in violation of national laws or international obligations, including those undertaken by cooperating States to a relevant regional fisheries management organization. **Unreported** fishing refers to fishing activities: (1) which have not been reported, or have been misreported, to the relevant national authority, in contravention of national laws and regulations; or (2) undertaken in the area of competence of a relevant regional fisheries management organization which have not been reported or have been misreported, in contravention of the reporting procedures of that organization. **Unregulated** fishing refers to fishing activities: (1) in the area of application of a relevant regional fisheries management organization that are conducted by vessels without nationality, or by those flying the flag of a State not party to that organisation, or by a fishing entity, in a manner that is not consistent with or contravenes the conservation and management measures of that organisation; or (2) in areas or for fish stocks in relation to which there are no applicable conservation or management measures and where such fishing activities are conducted in a manner inconsistent with State responsibilities for the conservation of living marine resources under international law.

Thank you for participating in this survey.

Definitions:

Industrial fishery: Capital-intensive fisheries using relatively large vessels with a high degree of mechanization and that normally have advanced fish finding and navigational equipment. Such fisheries have a high production capacity and the catch per unit effort is normally relatively high.

Semi-industrial fishery: Usually smaller vessels which are mostly ice carriers, making short trips and not venturing far from the shore due to the characteristics of the vessels (i.e. limited capacity to store and process fish products). Not equipped with sophisticated fish finding and navigational equipment.

Artisanal: Typically traditional fisheries involving fishing households (as opposed to commercial companies), using relatively small amount of capital, relatively small fishing vessels, making short fishing trips, close to shore, mainly for local consumption.

8.2 Industry Questionnaire

8.3 Questionnaire on Illegal, Unreported and Unregulated (IUU) fishing

8.4 for people involved in the fishing industry in SADC countries

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Background to the study

Illegal, Unreported and Unregulated (IUU) fishing is a pressing global issue with significant environmental, economic and social impacts. Developing countries often bear the greatest losses, making it a high priority issue in our region.

This survey forms part of a study commissioned by the Southern African Development Community (SADC), which aims to increase the understanding of IUU fishing in the Southern African countries of Angola, DRC, Madagascar, Mauritius, Mozambique, Namibia, South Africa and Tanzania.

The study will explore and help to quantify the magnitude and types of IUU fishing in the region as well as the economic, socio-economic, nutritional and biological impacts at both the national and regional level. The outputs and main findings will be presented at a ministerial conference in May of this year.

All your responses will remain anonymous.

Many thanks for your help and support.

Please send completed questionnaires by the 31st March 2008:

- **by email to martin@capfish.co.za**
- **or by fax to +27 21 425 1994**

Please complete the following questions (mark with a 'X' in the space provided for question 2 – 4).

1. Give a definition[36] of what you believe IUU fishing consists of?	

2. In what capacity are you involved in the fishing industry?	At sea: fisherman / vessel captain /crewmember		Land based: shore skipper / vessel manager / license holder / employee of fishing company			Land based: vessel agent / fish buyer or trader / fish exporter					
3. How long have you been involved in the industry?	Longer than 10 years		Between 2 and 10 years			Less than 2 years					
4. In which of the following fishing sectors are you involved?	Large pelagic resources (highly migratory)[37]		Demersal & reef fish resources (both deep-water & on the shelf)[38]		Small pelagic resources[39]		Crustacean resources[40]		Sedentary coastal resources[41]		
5. In which SADC country[42] are your fishing interests mainly based? (name one country only)											

[36] You can refer to the FAO definition of IUU fishing at the end of this questionnaire to complete the rest of the answers, but please give your own definition for question 1.
[37] These would include tunas, billfishes, pelagic sharks etc.
[38] Including snappers, groupers, emperor, rabbit fish, hake, alfonsinos, wreckfish, orange roughy, armourhead, deepwater rockcod etc.
[39] Including mackerels, sardinella, pilchard, anchovy, red-eye etc.
[40] Including prawns, rock lobster, deepwater crabs etc.
[41] Including abalone, mussels, octopus, sea cucumber etc.
[42] DRC, Angola, Namibia, South Africa, Mozambique, Tanzania, Madagascar, Mauritius

6. Do you have fishing interests in more than one country in the SADC region? If yes, please name these.	

Answers to the following questions should reflect your views on the country where the majority of your interests are based (see question 5).

Measures /Actions in respect of your state's nationals	Yes	No	N/a	9 Comments
7. Do you think people involved in the fishing industry are generally aware of IUU fishing and its impacts?				
8. Have you or people involved in the fishing industry in your country been made aware of the effects of IUU fishing by the government or any fisheries stakeholder group or organisation?				
9. Are you discouraged from doing business with those engaged in IUU fishing?				
10. Does the government of the country named in (5) have the means to control the fishing activities of the vessels registered in the state either: (i) in its own EEZ; or (ii) outside the EEZ?	(i)			
	(ii)			

Measures /Actions in respect of your state's nationals	Yes	No	N/a	9 Comments
11. Are you aware of transshipments at sea in your country's waters (EEZ) which are not monitored by local authorities?				
12. Do you think authorities in your country have adequate monitoring/inspection systems in place to determine the catch being taken and/or landed in your ports				
13. Are you aware of vessels that have been granted licenses to fish in your country's waters and which have a recent history of IUU fishing?				
14. Are you aware (through rumour or confirmed sightings) of vessels fishing in your country's waters without a valid authorisation?				
15. Are you aware of any laws in your country that make it a violation to conduct business or trade in fish or fish products derived from IUU fishing?				
16. If there are laws in your country prohibiting the trade of products of IUU fishing (question 15) do you think they are effective and enforced properly?				

Measures /Actions in respect of your state's nationals	Yes	No	N/a	9 Comments
17. Do you think fisheries inspectors in your country have a good knowledge and understanding of the legislation they are supposed to enforce?				
18. Do you think fisheries inspectors in your country are given the necessary powers to carry out their functions especially towards fighting IUU fishing?				
19. Do you think corruption occurs in the enforcement of fisheries regulations in your country? *If "Yes"– Do you think corruption occurs on the administrative side (with the issuing of licenses, allocation of quotas etc) and/or on the enforcement side (inspections, issuing of fines etc.)?*				

20. Please indicate with a score from 1-5 (see the scale below) in each of the boxes, **based on your experience** your perceived gravity of each of these offences for each of the time periods. Use N/A (not applicable) if you have no information/opinion on a specific period or type of offence.

6. A common offence which occurs often (around 100+ cases per year)
7. A relative frequent offence (around 20-100 cases per year)
8. An offence which does not happen often (around 5-20 cases per year
9. An offence which rarely occurs (maybe 0-5 cases per year)
10. An offence that never occurs (0 cases per year)

Offence	Pre 1990	1990-2000	2000-2005	2005-present	Comment
Fishing without a valid license					
Fishing with unauthorized gear/techniques					
Fishing in closed/restricted and areas/times					
Catching/landing of prohibited species					
Mis/under reporting of authorized species					
VMS mis/non-reporting					
Other – please give details					

FAO Definition of **IUU** Fishing: **Illegal** fishing refers to activities: (1) conducted by national or foreign vessels in waters under the jurisdiction of a State, without the permission of that State, or in contravention of its laws and regulations; (2) conducted by vessels flying the flag of States that are parties to a relevant regional fisheries management organisation but operate in contravention of the conservation and management measures adopted by that organisation and by which the States are bound, or relevant provisions of the applicable international law; or (3) in violation of national laws or international obligations, including those undertaken by cooperating States to a relevant regional fisheries management organization. **Unreported** fishing refers to fishing activities: (1) which have not been reported, or have been misreported, to the relevant national authority, in contravention of national laws and regulations; or (2) undertaken in the area of competence of a relevant regional fisheries management organization which have not been reported or have been misreported, in contravention of the reporting procedures of that organization. **Unregulated** fishing refers to fishing activities: (1) in the area of application of a relevant regional fisheries management organization that are conducted by vessels without nationality, or by those flying the flag of a State not party to that organisation, or by a fishing entity, in a manner that is not consistent with or contravenes the conservation and management measures of that organisation; or (2) in areas or for fish stocks in relation to which there are no applicable conservation or management measures and where such fishing activities are conducted in a manner inconsistent with State responsibilities for the conservation of living marine resources under international law.

Thank you for participating in this survey.